QUEENSLAND AGRICULTURAL JOURNAL

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Agriculture.

COTTON V. WHEAT.

A Victorian farmer, writing lately to the "Producers' Review," stated that, with a crop of 27 bushels of wheat per acre, grown and harvested under ruling union rates of wages, the net profit at 4s. 9d. per bushel on 345 acres amounted to £1,222 4s. 7d., or £3 10s. 10¾d. per acre. A wheatgrower at Warwick said that, with a return of 20 bushels per acre the profit on wheatgrowing, after paying every possible expense, was £2 4s. 1d. with wheat at 4s. per bushel. He gave as the cost per acre £2 5s. 11d., including 10s. interest.

If a Queensland farmer harvested 27 bushels per acre from 345 acres and sold at 4s. 6d. per bushel, he would realise £2,095 17s. 6d. Deducting expenses on the scale given by the Victorian farmer—viz., £2 5s. 11d. per acre, or £792 1s. 3d.—the net profit would amount to

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£1,303 16s. 3d., or, per acre, a fraction over £3 15s. 6¾d. According to the Government Statistician's figures published in 1916, the mean wheat return for this State for the past ten years was 11·39 bushels per acre. The highest average per acre was 15·81 bushels in 1912, and the lowest, 4·42 bushels in 1915. The cash value of this latter yield per acre at 4s. 6d. per bushel would be 18s. 11⅛d., representing a loss of 6s. 11⅛d. per acre. On 345 acres the loss would be ruinous.

Taking the highest average, that of 1912, the cash return per acre is about £3 11s. 4d., less expenses £2 5s. 11d., leaving a profit of £1 5s. 5d. per acre.

How does this compare with a crop of cotton off the same area? Taking the average yield of seed cotton at only 1,000 lb. per acre, the yield on 345 acres would amount to 345,000 lb. At 2d. per lb., the gross return would be £2,875, and the expenses £2 16s. 11d. per acre, made up as follows:—First ploughing, 4s.; second ploughing, 3s.; first harrowing, 9d.; drilling, 1s.; second harrowing, 9d.; rolling (optional), 9d.; seed, 5s.; picking, at ½d. per lb., 1,000 lb., £2 1s. 8d.

The total outlay would thus amount to £981 16s. 3d., leaving a net profit of £1,893 3s. 9d., or a fraction over £5 3s. 11d. per acre.

The cotton-grower has many advantages over the wheatgrower. The only implements he needs are the usual ploughs, harrows, and seed-drill. The plant is drought-resisting, and will also stand up against heavy rain. Practically, there is no disease of the cotton plant in this State. The only trouble is, occasionally, the boll-worm; this insect can be easily controlled by planting a few rows of corn amongst the cotton, as it is the same pest which attacks the grain in the upper part of the maize cob. The cotton plant may be pruned after the crop is off, or it may be ploughed out and re-sown in the spring. If the cotton-field is within carting distance of a ginnery, no bags or bales are needed. The cotton may be put straight into a boxed-in dray, and delivered at the ginhouse weighing-machine, as is done in the cotton-growing States of America.

The cost of picking will be greatly reduced if the lately invented cotton-picking machines are placed on the market. Meanwhile, the light work is easily performed by men, women, and children. At ½d. per lb., pickers, according to their ability, can make from 8s. to 12s. per day. Expert white pickers in America can pick as much as 400 lb. in a day, in the height of the season, thus earning 16s. 8d. a day at far easier work than canecutting.

We have taken 1,000 lb. of seed-cotton as an average crop; but, in 1907, several farmers at Wallumbilla, Tallegalla, Vernon, and Mackay made crops of 2,000, 1,700, 1,500, 1,300 lb., the value per acre being from £8 11s. to £11 13s. A 2,000-lb. crop adds little or nothing to the expense except £2 1s. 8d. for picking the extra quantity.

With the revival of cotton-growing in Queensland, the establishment of ginneries will naturally follow. Ginning in a good cotton district is a profitable business both for the ginowner and the farmer, as the latter can get rid of his crop practically at his own door.

Taking the yield of lint from 1,000 lb. of seed-cotton as 400 lb. and of seed as 600 lb., the result from 345 acres would be 138,000 of lint and 207,000 lb. of seed.

At 10d. per lb., the average price of cotton in the British market in December, 1916, this is worth	£5,750
92½ tons of seed at £6 per ton	561
	£6,311

In addition to this, the woolly seeds of Upland cotton are passed through a special gin, which removes all the short lint, amounting to about 30 lb. per 600 lb. of seed. Thus the seed produced on 345 acres furnishes 10,350 lb. of the short cotton known as "linters," which sells at about £9 per ton, and adds £36 to the gin return, making a total return of lint of £6,347. The expenses of working the ginnery are:—

	£	s.	d.
Ginning for long lint, at ¼d. per lb.	359	7	6
Second ginning for linters, including wages, oil, &c. ..	10	0	0
Loss in weight owing to impurities in the seed-cotton, 5 lb. per 100 lb. of clean lint, 6,900 lb.	287	10	0
345 bales for long lint, at 4s. 2d. each	71	17	6
6 bales for linters, at 4s. 2d. each	1	5	0
Bailing and pressing	35	0	0
	£765	0	0
Purchase of seed-cotton, at 2d. per lb.	2,875	0	0
	£3,640	0	0

Net profit, £2,707.

THE COTTON CROP OF 1916.

The total quantity of cotton dealt with at the last ginning by the Department of Agriculture and Stock on the growers' account was 29,230 lb., from which there was obtained 10,066 lb. of lint, 18,284 lb. of seed, and 880 lb. of waste. The number of pounds of raw cotton required to produce 1 lb. of lint was 2·904 lb., and for 1 lb. of seed 1·6 lb. The percentage of lint to raw cotton was 34·4 per cent., and 1 lb. of raw cotton produced ·344 lb. of lint. The lint was sold locally at an average gross sale price ex store of 6·9d. per lb., the price obtained for the best lint being 7d. per lb. The seed was purchased by the Department for redistribution for planting, and after deducting ginning expenses the growers received a net return of 2·54d. per lb. of raw cotton, which, at the low average of 1,000 lb. of raw cotton to the acre, is equal to £10 11s. 8d. an acre.

Inquiries show that the average cost of planting, cultivating, and harvesting a crop of 1,000 lb. of cotton, per acre, is £2 16s. 11d. Thus the net return to the grower is £7 14s. 9d. per acre. Given a 1,500 or

2,000 lb. crop, such as has often been obtained in Queensland, the farmer's profit is still greater, as the only additional expense is that of picking the extra 500 lb. or 1,000 lb. of raw cotton. In the days of the civil war in America there were 14,000 acres under cotton in Queensland, and the farmers were paid 3d. per lb. for Uplands cotton. This paid them better than any other crop they could grow. To-day the farmers who sold their cotton to the Department of Agriculture at 1¾d. per lb. have realised nearly 3d. per lb. since the cotton was sold. This compares well with maize and wheat growing, especially wheat, of which the highest average yield for the past ten years was 15·81 bushels in 1912, and 4.42 bushels in 1915.

QUEENSLAND GUANO.

For a long series of years, supplies of guano were obtained from the Chincha Islands, off the coast of Peru. These barren islands, three in number, were covered with a deep deposit of guano, the deepest being about 300 ft. The guano was mined from the sea-level upwards. When we visited the place in 1860, there were at least 1,000 ships, all sailing vessels, loading or waiting to be loaded. In those days a ship was allowed about 100 laying days before she could begin taking in cargo. The trade has long since vanished, the guano deposits being exhausted, and no more is obtainable for export. We find, from an article in the "Brisbane Courier," that large quantities of bat guano exist in the caves in the neighbourhood of Rockhampton. The article says:—

"Mount Etna and the adjoining ridges are situated about 16 miles north from Rockhampton. The mountain and spurs consist of blue-grey limestone, and in the centre of the mountain sides are numerous caves and winding tunnels. The roof is white limestone, like slabs of polished marble. Over forty of these caves have been discovered, and myriads of bats have made them their home. Large deposits of guano have partly filled the caves, and in many instances the deposit is at least 20 ft. deep. It is here that the Mount Etna Caves become commercially interesting. The value of guano is well recognised the world over. A Sydney company, the Guano Fertilisers, Limited, has recently purchased the machinery, plant, and lease of the Mount Etna Caves. Skips have been laid to take the guano from one chamber to another, and to the hoist to be raised through the shaft to the side of the mountain. The guano is then conveyed by wire cable to the factory, where it passes through rotary screens, and the coarser material is elevated to pass through a crusher, which reduces it to powder. The factory is less than a mile from Phosphates Siding, on the main line. A motor tractor will be used to convey the guano from the factory to the railway trucks. Already large orders from New South Wales and New Zealand are reported. The Queensland agency has been entrusted to the Australian Co-operative Fertilisers, Limited, Roma street, and stocks will be available very shortly."

HARVESTING SUNFLOWER SEED.

Harvesting is effected either by cutting the heads of standing plants or by cutting or uprooting the plants, and in any case should be done before the seeds are quite ripe, so as to avoid loss of seed. The heads are dried to prevent them becoming mouldy, and the seed is removed either by holding the heads against a revolving cylinder studded with spikes or by special machinery. A simple and easily made device consists of a strong wooden disc about 2 in. thick and 3 ft. in diameter bound by a stout iron rim and worked by a pedal and crank (or by a belt if power is available). It is mounted in a similar fashion to an ordinary grindstone. Stout nails are driven through the disc parallel to the axis and near the periphery, and are allowed to project about ½ in. on each side. A band about 6 in. wide is formed in this way, in which the nails are not more than about ½ in. apart. The seeds are removed by holding the flower head against the nails while the disc is in motion. The seed can be separated from dried florets and other light impurities by winnowing, and should be carefully dried in order to prevent fermentation during storage.—"Cyprus Journal of Agriculture."

A NEW CROP FOR QUEENSLAND.

The introduction of new commercial crops is a matter which the Department of Agriculture and Stock has had under consideration for some little time. Inquiries have elicited the fact that prices for flax (linseed) of commerce, like many other primary products, have materially advanced, and reached a stage when it should be remunerative to the grower, provided anything like a normal season is experienced.

There is no question about the ability of the plant to thrive, particularly within the coastal belt on the free-working alluvial types of soils from the Burnett to the Tweed; also on similar classes of country on the Downs close to the Range, where a good rainfall is to be expected. Experiments at State farms and the Agricultural College have proved that flax finds a congenial home here. At present no machinery is available in Queensland to treat the plant for its highly valuable fibre, but present and prospective prices indicate that the growing of the crop in the meantime, for its seed alone, will be a sufficient inducement for farmers to take the matter up.

The cultivation and successful raising of the crop present no difficulties; seeding, harvesting, and threshing can be effected with labour-saving machinery.

The principal firm of linseed oil and cake manufacturers, Messrs. Meggitts, Limited, of Parramatta, New South Wales, advise that: "As far as an assurance to Queensland farmers that a satisfactory market would be obtained locally is concerned, we would say that no fear need be felt, at all events for some years. This year we consumed over 9,000 tons, and we estimate our requirements for next year at well over

12,000." . . ."Referring to the probable market price, this is somewhat difficult to forecast. Calcutta seed ranges from £11 per ton to as high as £18 per ton, c.i.f. and e. Sydney, and we should base the price we would pay Australian growers on the price ruling for Calcutta seed at the time of purchasing, taking into consideration the difference, if any, between the yield of oil in the Calcutta seed and in the Australian. We should think it probable that Australian seed would be worth, approximately, judged by its oil contents, £1 per ton less than Calcutta seed."

The present shipping charges, Brisbane to Sydney, aggregate £1 8s. per ton, or 8 2/5d. per bushel; rail freight, cartage, &c., at this end would need to be added.

The Department of Agriculture has made arrangements to secure a supply of seed to meet the anticipated demand.

Persons requiring seed should register their names as early as possible with the Under Secretary for Agriculture, Brisbane. Prior to the despatch of the seed, notification will be sent to applicants in order that the necessary remittance (with exchange) may be forwarded.

Price of seed, 6s. 6d. per bushel, f.o.b. Brisbane.

SOME NOTES ON GROWING FLAX (LINSEED).

SOIL.

Flax can be successfully raised in a fairly wide range of soils; those of a free-working, loamy nature, alluvial in character, are very suitable. Well-prepared new land is also to be preferred on account of its freedom from weeds, flax being a poor weed-fighter.

The soil should be prepared well in advance of the planting season, and kept in good tilth until ready to plant. Thorough cultivation ensures a plentiful supply of plant food and moisture, and better prospects of higher yields.

TIME TO PLANT.

Sowings can be made during May and June; the latter date will in all probability be found the most suitable for localities below the range.

METHOD OF PLANTING.

The crop can either be drilled in or broadcasted. For the former method, the grass-seeding attachment on the wheat-drill can be used. In the event of the drill not being fitted with such, the seed can be mixed with about twice its bulk of sifted sawdust and sown similarly to wheat. The depth to be covered will depend somewhat upon the type of soil and the amount of moisture present. A depth of over 2 in. is not recommended.

SEED REQUIRED PER ACRE.

This plant does not stool. When sown for fibre, a long, straight stalk is required, which is induced by thick seeding. In growing the crop for grain, a thinner seeding must be made, so as to encourage branching and seed-production.

In drilling, 40 to 50 lb. of seed is sufficient to plant an acre. In broadcasting, 60 to 70 lb. would be necessary.

Plump, well-developed seed should only be sown; thin, scaly seed should be avoided.

HARVESTING.

This can be carried out in several ways, but most expeditiously with the reaper and binder.

Great care must be taken not to allow the crop to fully mature before cutting, otherwise shelling would result, and a large percentage of the seed would be lost.

It will generally be found necessary to stook the sheaves for about a fortnight before threshing out the grain or placing it in a stack. Threshing out of "stock" is to be preferred. To save loss of seed when handling, spread tarpaulin or bag-sheeting over dray or wagon.

THRESHING OUT.

A special machine is required when threshing the crop for its fibre. When only the seed is to be secured, the ordinary type of wheat-thresher will answer the purpose, sieves being fitted to suit the size of the seed. A small peg-drum thresher can also be used, or a simple power-driven device consisting of two wooden rollers about 2 ft. in diameter. The top roller—resting upon the bottom—should be fitted with slotted bearings to allow a perpendicular play of about 2 in. The weight of the roller is sufficient to crush the husk, allowing the seed to fall out.

The sheaves can also be left intact by supporting the top roller at one end on a long bearer, thus permitting the sheaves fed from the end of the rollers to pass through sideways. Only the "seed end" of the sheaf need pass through.

The seed when cleaned should be placed in sound bags of close texture.

Under favourable conditions a yield of from 14 to 20 bushels per acre may be expected.

ENCOURAGEMENT TO COTTON-GROWING IN INDIA.

It is stated in an article in the "Indian Trade Journal," on Cotton-growing in India, that the short-staple cotton yielding a heavier out-turn per acre than the indigenous long staple was first introduced in various places with the idea of mixing the short and long staple together. After watering, the mixture is practically indistinguishable from long-staple cotton until it is actually brought into use in the spinning mills. For a time the mixture fetched the same prices as long staple; but once the

practice became generally known, prices were noticeably reduced. In districts where long staple was grown, short staple was actually imported by rail to be mixed and watered with the local cotton. If no steps had been taken to check this tendency, every district would have lost its reputation as a cotton-producer. The deterioration of Hyderabad cotton resulted in a loss to the ryot (peasant farmer) of 5 rupees per acre, with the probability of a heavier loss in the near future. To remedy this state of affairs, farms were opened for the cultivation of pure long-staple and for provision of seed, but this was not enough. At first the ryots refused to use the seed from the farms until the Agricultural Department agreed to buy their kapas (seed cotton) grown from seed distributed by the farms and to hand over the profits to the ryots. This was done for one year, with the result that the demand for seed increased from 2,000 acres to 20,000 in the second year. The mill agents, now assured of long staple, are offering Rs. 10 more per kandi of 240 seers. There are thus very good grounds for hoping that the restoration of the indigenous long staple will be successful. Taking the average area under cotton in Mahratwara, it is believed that the ryots will be benefited to the extent of at least one crore of rupees. If these hopes are realised, the benefits which the Agricultural Department will have conferred on the State in the short period of its existence are exteremely remarkable.

EXTENDING THE CULTIVATION OF COTTON IN EASTERN BRAZIL.

Two important influences are operative in Brazil to bring about as large and as speedy an extension of cotton cultivation in that country as possible. The first is peculiar to Brazil itself, being the embarrassment caused to the domestic textile industry by the failure of the Brazilian cotton crop a year ago and the consequent very high prices attained by the staple. The second influence is the enormous increase in the market value of all kinds of cotton all over the world. Brazil is naturally a cotton-growing and cotton-exporting country; and those concerned with the economic welfare of the nation see in the very large returns obtainable from producing cotton at existing prices the strongest of inducements to push cotton-growing in every possible way. Various statements of Brazilian projects to this end have appeared in recent months in the pages of this paper. To these may be added a report lately made to Washington by United States Consul-General Alfred L. M. Gottschalk, Rio de Janeiro, as published in "Commerce Reports." Mr. Gottschalk says—

"By a decree dated 5th August, 1916 (Law No. 1161, State of Bahia), the local government of the State of Bahia offers the gratuitous use for the space of five years of certain State lands to individual cotton-growers, either native or foreign, or to persons who, not being agriculturists themselves, are desirous of founding colonies of agriculturists who would raise cotton. *At the end of this period the full title to the lands would revert to the individual planter in the first case, or, in the*

second case, to the person who had formed the colony. In the event, however, that the lands be not under proper culture at the end of the prescribed five years, the lands would revert to the State of Bahia. The State Government of Bahia also offers facilities in the way of distributing seeds, and promises to engage one or more specialists to instruct cotton-growers as to planting methods and the quarantine of blights and other diseases.''—'' Cotton and Cotton Oil News.''

[The Queensland Department of Agriculture offers to supply pure seed to farmers willing to grow cotton, give them all necessary instruction, and purchase their crops when harvested. Yet the response is poor, and a more payable industry than wheat, sugar, or maize hangs fire.—Ed. '' Q.A.J.'']

THE OUTLOOK FOR COTTON.

A report on the present position of the American cotton market, and the prospects for the future, appeared in the '' Cotton and Cotton Oil News,'' of 27th November. The report emanates from a cotton-broking firm at New Orleans, Louisiana, and reads as follows:—

'' From every State comprising the cotton belt have come reports of the largest spot merchants competing for offerings, and with the demand emanating from such sources all doubt has been dispelled as to the underlying strength of the raw material.

'' The fact of the matter is that as the season grows older and the cotton gradually disappears from the points of concentration, those short of their requirements are having it forcibly brought home to them that the year's growth is much below what the world actually needs. And while in peaceful times it would be relatively easy to square demand and supply through the agency of a sharp advance in prices, the great wastage of raw cotton and cotton goods occasioned by the war automatically creates such a demand for these commodities that they must be had, no matter what their cost, while any supply is available. Viewed from any standpoint, we can see no chance of a permanent decline in the price of raw cotton; on the contrary, we believe it will continue to advance until either a surplus crop is produced or the war terminates.''

COTTON PLANTS AS A MANURE FOR BANANAS.

An interesting experiment has been conducted in Fiji which consists in growing cotton before bananas as organic manure. Cotton-seed was sown at the rate of 6,720 lb. per acre, and when the young plants had reached an average height of 9 to 10 in. they were ploughed under. The total weight of the bananas produced in the plot manured in this way was 454 lb. compared with 282 lb. in the case of the control. The cotton-seed, therefore, seems to have had some effect.—''Agricultural News of Barbados.''

Pastoral.

PRICKLY-PEAR STOCK-FEEDING EXPERIMENTS AT WALLUMBILLA.

The undermentioned report has been presented to the Hon. Wm. Lennon, Minister for Agriculture, by the Prickly-pear Board appointed to control the experiments.

The information represents a summary only of deductions drawn from initial "maintenance" tests, and has been compiled from progress reports furnished by the chemist in charge of the station, Mr. Frank Smith, B.Sc., F.I.C., who has been deputed to present full data of the experiments for publication.

Two animals were slaughtered in the interests of the experiment. Particulars as to the effect of a pear diet, gained by *post mortem* examination, have been furnished by Mr. Adam McGown, M.R.C.V.S., and are attached as an addendum to the present report.

Experiments in feeding sheep commence in January.

The knowledge already gained from the "maintenance" trials with steers will be adapted for dairying operations, which will be initiated early this year.

MEMBERS OF PRICKLY-PEAR BOARD.

A. H. Cory, M.R.C.V.S., Chief Inspector of Stock.
J. C. Brünnich, F.I.C., Agricultural Chemist.
A. E. Graham, Chief Dairy Expert.
H. C. Quodling, Director of Agriculture.

PRICKLY-PEAR STOCK-FEEDING AT WALLUMBILLA.
OBJECT: PEAR UTILISATION.

1. As a drought stand-by for cattle and the preservation of herds.
2. To determine the exact requirements of animals when fed with pear. How to feed pear and what minimum of added food is necessary in conjunction to enable animals *to live, also to thrive.*
3. Water requirements: Whether water is necessary or harmful.
4. Physiological effect of pear diet.

Maintenance tests were carried on for six months with eighteen young bullocks.

Certain deductions were made which have an intimate bearing on the question.

Animals had to be quietened and taught to feed, and it is estimated that several beasts lost up to 80 lb. weight each in condition before settling down to pear-feeding.

PLATE 4.—VIEWS AT PRICKLY-PEAR STOCK-FEEDING EXPERIMENT STATION, WALLUMBILLA.

Those fed exclusively on pear up to their maximum consumption, 62 lb. per day, gradually wasted, as there was insufficient nutriment in this amount to maintain life for more than strictly limited periods; the practice of feeding on pear alone had to be discontinued to save the animals' lives. However, when fed with small amounts of other food, lucerne chaff or oilcake, they promptly improved.

Machine-sliced pear proved as acceptable to stock as boiled pear.

It was found unnecessary to singe either the spines or prickles prior to slicing and feeding. The only preparation found necessary was to pass the pear through a power-driven slicer.

FOOD VALUE OF PEAR.

This has been proved, as a food, to be equal to many root crops—mangolds, &c.—commonly used elsewhere. It is obvious that pear can be handled and fed to stock at a cost much below that of cultivated crops.

The animals under experiment failed to consume, even in the case of the heaviest pear-eaters, more than 90 lb. per day. The average daily consumption of pear per capita was less than this amount; and naturally the animals suffered a deficiency in nourishment and rendered it imperative to add nutrients to compensate for the shortage of protein in the ration.

In the cases under review it was proved that by the addition of a few pounds (3 to 3½) of lucerne chaff or a lesser poundage of linseed oil cake (2 to 2½ lb.), procured at the present cost of slightly over 2d. per head per day, the thriftiness of the animals was restored, and they gained body weight at the rate of one-third of a pound per head per day, and this applies to the coldest period of the year. With the advent of warmer weather and when fed rations similarly constituted, as far as the value of concentrates is concerned (2d. per head per day), certain animals, the more lavish pear-consumers, improved sufficiently in condition to be fit for beef purposes, and individuals gained in flesh to the extent of ½ lb. per day.

Two beasts used in the feeding tests were sold to a local butcher and slaughtered under veterinary supervision to determine the effect of an almost exclusive pear diet, and these proved to be quite satisfactory for beef purposes, and carried a light though even distribution of fat, the carcass weights being 664 and 652 lb. respectively. The veterinary surgeon's (Mr. A. McGown) attached report shows that with the exception of a minor ulceration of tongue, palate, and stomach, the animals were otherwise remarkably healthy and free from any general inconvenience attributable to a pear ration. There was, however, distinct evidence throughout to show that the mucous membranes of the various digestive organs had become thickened, the result of irritation, but no lesions of a serious nature were found. No fibre had accumulated in the stomachs of the animals, and its absence may be accounted for in a measure by the fact that the pear was sliced before being fed.

Results demonstrate the feasibility of promoting advancement in condition of animals with pear as a sole roughage, and feeding trials proved in the case of those beasts which consumed pear freely (70 lb. and over per day) that no useful purpose would be served by supplementing what may be termed pear roughage with ordinary hay.

WATER REQUIREMENTS.

Ordinarily in the cool months of the year, stock do not require water, as the moisture in the pear provides sufficient.

The animals at the Pear Station did not receive any water for 150 days, but as soon as warm weather set in they exhibited a desire for water, which was provided in unlimited but measured quantities without any injurious result.

FUTURE WORK AT THE PEAR STATION.

It is purposed to follow up the work at the Station by introducing feeding trials with five groups of sheep (ten each), to determine the effect of a pear diet on this class of stock whilst woolgrowing and when rearing lambs.

With the data at their command, as a result of the initial experiment work, it is now opportune for the Prickly-pear Board to determine the possibilities of dairying—

(*a*) Whether it is possible to profitably engage in this occupation in country thickly infested with pear.

(*b*) To ascertain whether pear country can be satisfactorily used for maintaining dairy stock in time of drought.

(*c*) To decide the most satisfactory means of doing so.

Further, the Board recognises the importance of showing whether, in times of food scarcity or drought, live stock (sheep and cattle), may be railed to pear country contiguous to the railway line and be satisfactorily maintained by feeding them with such a cheap and abundant food as pear merely by the addition of small quantities of nitrogenous food.

REPORT BY ADAM McGOWN, M.R.C.V.S.

6th November, 1916.

SIR,—I have the honour to report that I visited Wallumbilla on the 3rd instant for the purpose of making a *post mortem* examination on two young bullocks from the Prickly-pear Stock-feeding Experiment Station which had been maintained on a pear diet supplemented by small quantities of protein-yielding food for a period of some six months.

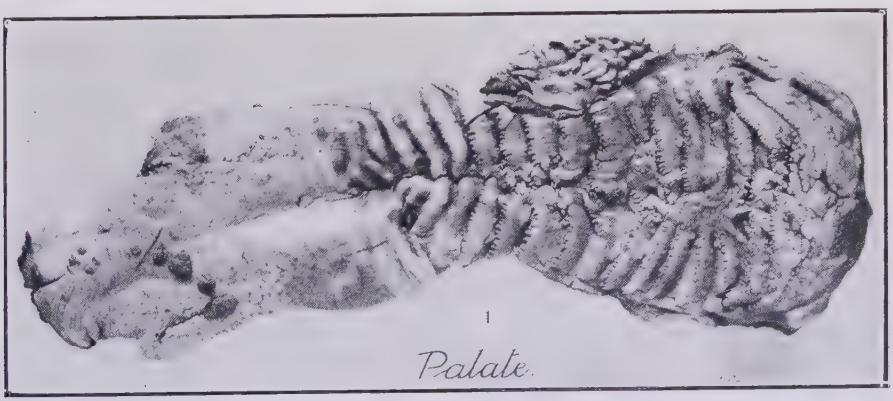
Both animals were grades between three and four years old and apparently raised from dairy stock. They appeared to be evenly though lightly fleshed, and were thrifty in appearance. A *post mortem* revealed certain features attributable to regular and constant employment of a pear diet. Its effect on various organs of the body was confirmed by a similarity of results found in each animal examined, leading to the conclusion that whenever cattle are placed in the position of having to obtain the major part of their sustenance from pear, similar changes to those enumerated are to be expected.

From inquiries made, it has been shown that the daily pear consumption of animals at the Station was not always regular, and this fact seemed to indicate that pear was unpalatable, however—an opinion borne out by *post mortem* results, shows fairly conclusively that at times the soreness due to ulceration of tongue would act as a check to mastication.

Post Mortem: General Appearance.—Carcass in both cases well nourished and entirely healthy. Flesh: Good colour, nicely grained, and of good quality. The fat, though not plentiful, was evenly distributed and of a good clear white colour and quality.

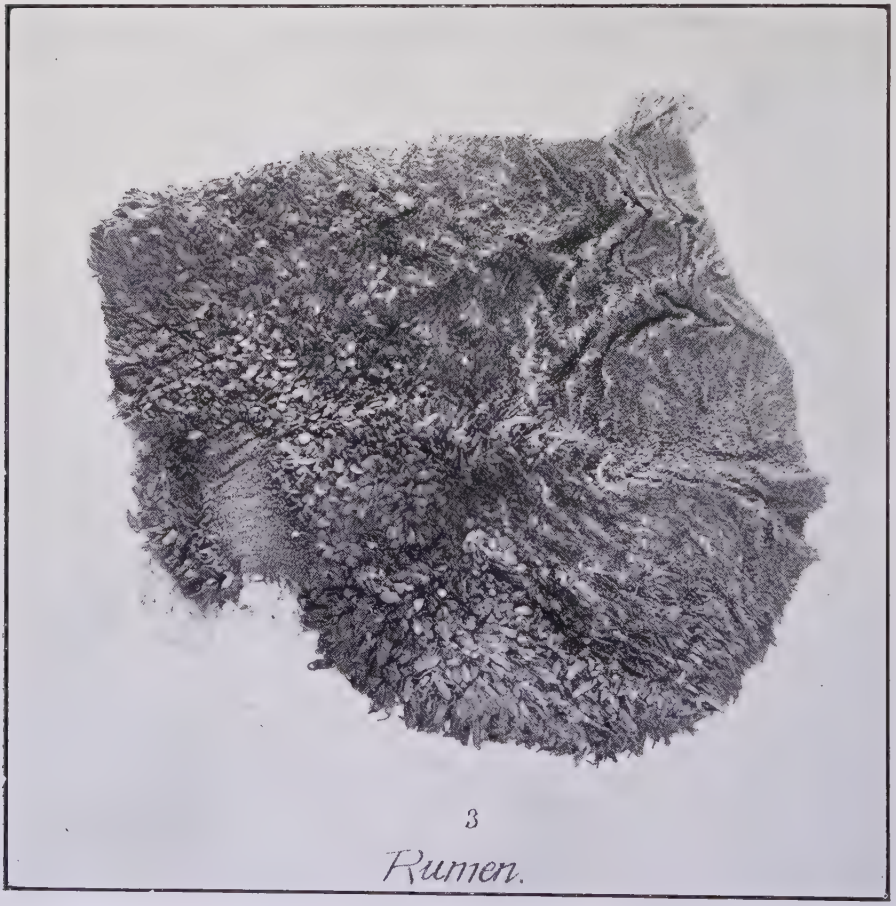
Alimentary Tract.—The changes from normal proved to be as follows:—Tongue: Mucous membrane disturbed by five ulcers in one case, and six ulcers in the other, the size of which approximated ¾ in. in diameter throughout. The sides of tongues in both instances showed the presence of several small nodules, caused by spines penetrating the membrane of the tongue, which in the ordinary course of events would have a tendency to burst, leaving a raw sore. The tongues carried a number of fine spines and prickles.

Oesophagus.—The mucous membrane of this organ showed no marked change, and in both instances proved to be free from prickles.



Specimen 1: *Palate.*—Thickened and roughened, with a few small abrasions and several small excrescences; no prickles present.

Specimen 2: *Cheek.*—The papillæ show an increase in size. The anterior portion of the gum of one animal was ulcerated (ulcer 1½ by ½ in. approximately), and contained a group of fine prickles.



Specimen 3: *Rumen.*—Mucous membrane exhibited differences, one portion being normal, whilst adjoining it the papillæ were increased in size and in length and thickness.

4
Rumen.

5
Reticulum.

Specimen 4: *Rumen.*—All the mucous membrane showed a regularity in condition—viz., the papillæ covering the membrane were also increased in size and gave evidence, in a few instances, of small perforations apparently from pear spines.

Specimen 5: *The Reticulum.*—Mucous membrane much thickened and toughened in both animals, and showed at one portion a tendency to ulceration.

Omasum.—In both cases showed no marked change from normal.

Specimen 6: *Abomasum.*—In both animals the mucous membrane was greatly thickened throughout; a portion of the membrane in each instance was covered with colonies of fine prickles embodied in the membrane. These (prickles) were apparently unaffected by the digestive fluids.

Contents of Stomach.—Quite fluid, due to the large percentage of moisture in the pear fed to the animals. No fibre present.

Summary.—The *post mortem* appearances indicate that animals can assimilate a pear diet and thrive, provided it is presented to them after passing the pear through some form of slicing or pulping machine to break down the spines or prickles present.

It is evident also that the animals examined received a sufficiency of supplementary flesh-forming (nitrogenous) food to properly nourish their systems and build up their tissues satisfactorily.

The Chief Inspector of Stock, Brisbane.

SHEEP ON COASTAL AREAS.

The various articles which have been written for this Journal, on the advisability of raising sheep of certain breeds on our coast lands by the help of artificial grasses, have been the means of establishing many thriving flocks on lands where, in years gone by, sheep proved a failure. We have received the following letter addressed to the Under Secretary for Agriculture by a gentleman at Nebo, under the pen name of "Malabar":—

"I have been much interested in the articles on 'Coastal Sheep,' and I think Mr. W. G. Brown and the department are to be congratulated on their enterprise in drawing the attention of coastal farmers generally to the possibility of establishing such a suitable and profitable industry as sheep, and particularly fat lamb raising on small areas near the market, and adapted to small purses. If, as advised, farmers who know nothing of sheep, buy small lots for a start, or even confine themselves to fattening little lots of store wethers (even merino wethers on artificial grasses will pay for fattening), they can make a handsome and interesting addition to their work and incomes. About twenty-five years ago I spent six months on new country just outside Napier, Hawke's Bay, New Zealand, and assisted in the opening and development of an area of about 5,000 acres for a Napier firm. This country is hilly, and was covered with 'bush' (or heavy vine scrub, as we call it), and was felled and burnt off in the same manner as we do in Queensland. A mixture of grasses—principally English grasses—was then sown, and within six weeks of sowing we had ewes and lambs on it. The fencing was all barbed wire stapled to posts and strained very tight. The sheep run were Leicester sheep, and the rainfall about 40 in. Around our place there were a number of small farmers, on areas of from 50 to 100 acres of land, and all ran sheep and a few cows, and all were prosperous. I cannot see why our North Coast lands should not be equally suitable for either English or crossbred sheep, and coastal farmers would certainly have an immense advantage over inland farmers in both regular rainfall and accessibility to markets.

"In one direction, I think, further experimenting and inquiry would be advisable and interesting, in view of opening coastal areas and improving same for grazing purposes. As this is practically intense farming applied to grazing, a study of mixtures of grasses suitable to local conditions, in place of confining attention to one or two separate varieties, would be advisable; also cultivation of crops such as turnips for fattening. In New Zealand turnips are grazed in the field, the sheep themselves doing their own foraging. Large areas each year are cultivated for sheep alone. In any case, the subject is an interesting one, and so much attention has been drawn to 'Farmers' Sheep on the Coast'

that I am sure articles in your Journal bearing on fodder crops suitable for coastal lands—turnip, mangold wurzel, &c.—which could be obtained from New Zealand sources (North Island preferably), would be much appreciated by farmers who have an idea of engaging in this industry.

"One very attractive feature about lamb-raising is that it is a business that all members of a family can take an interest in. Children are especially good with lambs, and it is wonderful how fond they get of them and what useful and timely work they can do. Personally, although I am now engaged in cattle-raising, I have had many years of experience in sheep, on dry areas and on natural grasses, and I keep a little flock of about 100 running about the homestead. My children look after them almost entirely, and owing to the care they take of the ewes and young lambs they thrive well and the lambing is phenomenal.

"No matter how small a farm is, I am convinced a few sheep will pay, and pay handsomely, if it is only for home consumption of the mutton and a few to sell to neighbours, &c.; and with the small, cheap machines for shearing now obtainable, and which can be geared to any oil engine, the trouble of shearing presents no very great difficulty.

"To conclude, I am sure that any man running a little flock of suitable sheep (crossbreds for preference), using reasonable care, and in any difficulty seeking the advice of Mr. W. G. Brown, the sheep expert of the department, cannot help making a success of it, if he follows the sensible plan of a small flock first and build up as he gains experience."

PAPER QUILLS FOR CUTWORMS.

A DEADLY ENEMY FRUSTRATED.

An amateur gardener of the good old sort and a reader and subscriber of your interesting paper from its inception sends you the following "dodge" for the benefit of those who may not be aware of it. We all know how the *cutworm* (Dutch *misworm*) attacks and destroys plants put in by us in our garden, notwithstanding the liberal application of, for instance, vapourite and other remedies. In one night these pests have been known to eat off whole rows of such plants as tomatoes, cabbages, cauliflowers, &c.

Try the following simple and inexpensive remedy and "sure cure":—Before putting your plant in the ground wrap around the stem just above the roots some stout brown paper (or for that matter paper of any sort), say about 3 in. wide; then put in your plant with the paper round it covered about half-way in the ground. This will effectually prevent the worm from eating off the plant, as he can't eat through the paper, and we know he does his mischief *only just on the surface* and cannot climb. The paper has the additional advantage of holding up the plant after being put in the ground, and by the time the plant is strong enough the paper has rotted away.—" South African Gardening and Home Life."

The Orchard.

THE NAVEL ORANGE.

CINCTURING.

By R. G. BARTLETT, Head Teacher, Buderim State School.

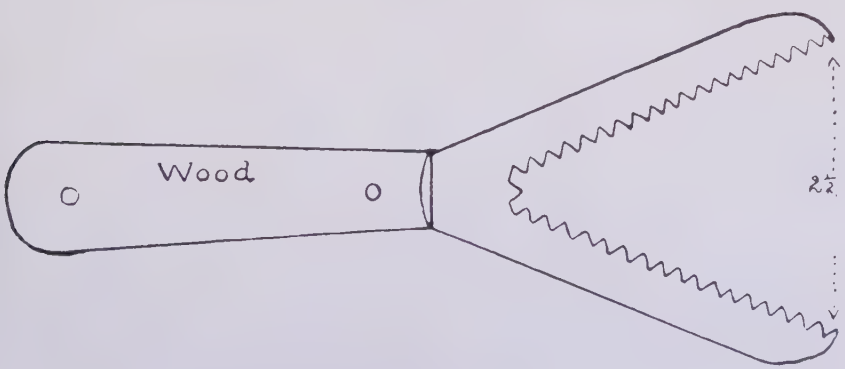
Quoting from Mr. Benson's book on "Citrus Culture"—"The tree is a strong and vigorous grower, with large dark-coloured leaves and a few small thorns. . . . The fruit is of a large size—in young trees over-large—having a fine, thin, smooth skin, which thickens considerably towards the stem end, and is usually of a pale-orange colour. The pulp is juicy, sweet, of fine flavour, contains very little rag, and is usually seedless. It is one of the first oranges to ripen, and has good keeping qualities, hence is a good shipper and valuable for export."

From this description the navel orange should be the ideal variety for a citrus man to grow; but, unfortunately, the experience of most growers is that, though the navel blooms profusely, it seldom sets a good crop of fruit—number as well as quality being required to make any variety a commercial success.

Numerous experiments have been and are still being carried out in order to assist nature in the setting of the fruit.

In irrigation areas, all that is needed is to flood the ground with water during the flowering season. But in Queensland irrigation is practically *non est,* and so something has to be found to take its place. One grower has tried removing a ring of bark from the trunk of the tree during the flowering, with splendid crops as a result. This, however, is too drastic for most orchardists, as they consider the life of the tree would inevitably be shortened by this practice. A more common and fairly successful method is to hammer a piece of No. 12 fencing-wire its own depth into the bark all round the trunk. This, however, tends to damage the young, soft wood, and cause unsightly excrescences.

After studying the methods and results of cincturing grape vines, the writer had a special tool made by the blacksmith as per the rough sketch.



The teeth of saws were set so that both cut at the one time, while the shape permits of the tool being used on any limb up to 2½ in. in diameter.

With the tool the bark of the limbs was cut through when the blossoms were well out. It has been found that in the case of deeply cut limbs, the crop set has been very heavy, while superficial cuts apparently did not cause any more fruit to set than was set on adjacent uncinctured trees. In one orchard, four out of six trees were cinctured, and the cuts tied round with raffia fibre to promote more rapid healing, but the result has been a failure, as not much difference can be seen between the crop on uncinctured trees and that of the cinctured trees, though the grower admits that beetles or bugs have been very busy eating the young fruit. However, in this one case only, failure has resulted, owing either to tying cuts with fibre or to the depredations of insects. Next year extended experiments should give more definite results.

Similar experiments in cincturing navel orange trees are being carried out on the Blackall Range—namely, at Montville and at Mapleton. A comparison of methods and results would greatly assist in perfecting the work and in removing cincturing beyond the experimental stage, thereby benefiting the citrus-growers of the State.

Buderim Mountain, 20th November, 1916.

ARSENIC SPRAYING FOR THE BLACKBERRY PEST.

Mr. Allen M. Williams, of Te Aute Station, Pukehou, Hawke's Bay, New Zealand, describes, in the 'Journal of Agriculture' of New Zealand, 20th December, an effective and comparatively inexpensive weapon for the destruction of the blackberry pest. He says:—

"In reference to our treatment of blackberries, we first cleared the stock out of the paddock, and then sprayed the blackberries with 2 oz. arsenic to the gallon of water. When the bushes had quite dried off—say, in a month—we burned them. The man in charge of the work would then go to each bush twice a week to spray the young shoots as they appeared. In our soil (limestone subsoil), after the first week or two, it would only require looking at once a week, and gradually ease off until no more shoots appeared. The point is, not to let the young shoots get into leaf. The best time to spray is when the blackberries are in flower and the sap well up. If one is careful not to let the young shoots get into leaf, the stock can be put back into the paddock after the blackberries have been burnt, including any grass which may have been affected by the poison. We have always done this, and never lost a hoof. All our blackberries were absolutely destroyed in a very short time, but in lighter soils I can quite understand that it might take much longer. Do not cut the bushes down, but spray them as they stand."

THE AVOCADO PEAR.

This fruit has nothing in common with the European pear. It merely resembles the pear of our orchards in shape. It is of the size of a large Jargonelle pear, has a tough coat, and contains a large, rugged seed. The fleshy part of the fruit is of a bright-yellow colour,

with a rich, delicate, creamy texture of about the consistency of firm butter, and with the fine flavour of a fresh walnut. In the West Indies, of which it is originally a native, it is called "subaltern's butter," and sometimes "vegetable marrow." The richness of the pulp necessitates the addition, when eating it, of something pungent, such as pepper and salt, wine, or limejuice and sugar; but the favourite condiment is pepper and salt. It is propagated from seed, but may be struck from cuttings of half-ripened wood without mutiliating the leaves. The tree attains the size of our apple-trees, and it grows well and fruits freely on our coast lands. It is being grown by Mr. Bliss, of "Glen Retreat," Enoggera; also at the Penal Establishment at St. Helena, and the Botanic Gardens, Rockhampton. A few seeds might be obtained from these sources. The Department of Agriculture has none for distribution. Rooted plants in pots can be obtained from S. Eaves, nurseryman, Adelaide street, Brisbane.

THE CAROB TREE.

We are indebted to Mr. W. S. Campbell, Cooregab, Vaucluse road, Rose Bay, Sydney, for the following useful information concerning the Carob Tree:—

"When the Pera artesian bore, near Bourke, New South Wales, was taken over by the Agricultural Department of that State, I caused to be planted several small carob trees, as an experiment, to test their suitability for the climate when irrigated with artesian water. Three thrived admirably, and grew into most beautiful shady trees, one of which produced fine crops of pods. I saw these trees not long before I retired from the department, and they were then splendid specimens, and are probably still thriving. This little experiment shows clearly that the carob is well suited for the Western districts—500 miles from the coast, at any rate—and that the artesian water of the Pera bore suited them well. I may mention that the south Australian 'Sugar Gum' also thrived splendidly there, as well as the Olive, which produced really wonderful crops of excellent fruit, and the trees are absolutely free from the Black Olive Scale."

THE MacGREGOR PINEAPPLE.

In February last year we gave a description of the MacGregor pine-apple, grown at Campsie Fruit Farm by Mr. E. Smallman. This was accompanied by an illustration of the crop on a field planted in September, 1914, which the plants bore in 1916. This year the yield has been far greater than that of the first crop, as will be seen by the photograph taken in January last. The first crop averaged 10,000 pines per acre, and the average weight of the single fruit was 4½ lb. Mr. Smallman has already gathered several hundred cases for shipment South, and at the time of writing there were enough pines on the plants to fill a couple of hundred more cases. This goes to show that pineapples pay well if a good variety is grown and proper cultivation is given. The MacGregor pine brings the highest price in the Sydney market.

PLATE 5.—THE MACGREGOR PINEAPPLE CROP OF 1917 AT MR. E. SMALLMAN'S FARM, "CAMPSIE," ORMISTON.

Viticulture.

WINE INDUSTRY.

THE CELLAR.

By G. A. GATTINO.

A cellar, to be really good, must satisfy three conditions—

(1.) Has to be built so that the internal atmosphere marks the required temperature for maturing the wine.

(2.) Shall not be disturbed by winds or other causes affecting the quietness.

(3.) Must be kept sufficiently clean.

As I have previously stated, the tumultuous fermentation requires a temperature from 30 to 70 degrees F.; but the insensible fermentations (which complete the maturing of the wine) should have a temperature varying from 30 to 40 degrees F. A cellar should also be built in order to participate, in a progressive way, to the atmospherical changing of the seasons and shall not reciprocate the rough changes of them.

A cellar where the atmospherical disturbances could not be controlled is not adapted to improve and keep the wine. The latter at each rapid elevation of temperature would bring about precipitous fermentation, and at each sudden fall of same would cease to ferment before the correct time. These sudden changes of temperature, which damage the wine very much, are experienced in buildings situated above the ground level, and such cellars should be totally abolished, as well as all cellars too much under ground, as in the case of many old cellars of the old country, which were once built on this wrong idea. In this latter class of cellars, the atmosphere keeps a uniform temperature during all the year, therefore the wine, not being able to get the insensible fermentations required for improving and completing, cannot mature properly. The wine will become clear and drinkable, but, as it could not divest itself of the substances which precipitate only by the succession of insensible fermentations, when this wine is brought from the cellar it is liable to re-ferment and become cloudy and undrinkable.

A good cellar, therefore, should have the floor about 10 or 12 ft. under the ground level, and be provided with thick walls. The door of the cellar should open to the south, and, if possible, not leading direct to the open air. Several small windows with blinds are required, and should be highly situated. As a matter of fact, the sun must not penetrate into the cellar at all.

As the quietness of a cellar should not be disturbed, it is necessary that the latter be sheltered from the direct force of the winds and be

situated far from streets with continuous traffic. The wine, for refining and maturing well, requires a more or less long calmness, thus enabling it to slowly become free of all the small particles of dregs which precipate very slowly.

The French enologist, Vergnette Lamotte, was right in saying: "Les caves des grandes villes sont mauvaises" (the cellars of the big cities are bad).

The floor of the cellar must be well paved, not allowing the water to become stagnant. It is advisable that this floor have a slight descent to the centre of the building, falling towards a small cemented sub-well. Such small well would serve also the purpose of receiving any wine that would eventually spill from the casks if a breakage or leakage occurred in the absence of the cellarmen. To prevent the formation of humidity or mouldiness, the walls of the cellar should be plastered with hydraulic lime.

Besides the abovementioned conditions, the cellar must be kept thoroughly clean, not allowing the deposit of anything unconnected with the manufacture of the wine, especially things of a fermentable nature.

The cellar must be carefully and frequently washed, swept, and cleaned, preventing all formation of cobwebs, mouldiness, &c.

All these precautions have to be adopted by the winemaker who wishes to produce good wine. I will give the reasons why they are indispensable later on, when I write on the theories of the fermentations.

To complete the descriptions of the buildings required for making wine, I will only add a few words referring to the store or cellar for bottled wine. Generally the coolest part of the cellar is destined for the bottle department, but it would be better if a separate place could be built for this purpose. The bottled wine cellar, having to be used for the conservation of matured wine—whether in bottles, jars, or small casks—should be situated underground and have the floor at a lower level than the general cellar.

The wine to be placed in the bottle department has no need of further fermentation, but wants, instead, to be kept unalterable. This can be obtained by having the cellar for bottled wine very deep underground and with little light.

If any further description or plan of the abovementioned buildings are required, I am only too willing to give the necessary illustrations thereof.

Tropical Industries.

THE ACTION OF COPPER ARSENATE AND ARSENIOUS ACID ON SUGAR-CANE ROOTS.

The Bureau of Sugar Experiment Stations has received the following report from the Entomologist (Mr. E. Jarvis) :—

It is satisfactory to be able to state that experiments started at Gordonvale Laboratory last November, with the object of determining the action of copper arsenate and arsenious acid on growing roots of sugar-cane, have yielded results of a most encouraging nature, and are now far enough advanced to admit of publication of a few details regarding this research work.

In the first test, with arsenate of copper, short "sets" of "Badila" cane having three buds were planted in common 8-in. earthenware flower pots filled with coarsely sifted, red volcanic soil. Pots Nos. 1 to 4 were infected at the rate of 113 lb. of Paris Green per acre; the poison being mixed uniformly with the soil in pots Nos. 1 and 2, but buried in a horizontal layer a couple of inches below " sets" in Nos. 3 and 4.

No. 5 was treated at the rate of 226 lb. of the arsenical preparation per acre, thoroughly mixed with the soil; while Nos. 6 and 7 were untreated controls. These "sets," which were planted on 3rd October, sprouted together, all producing healthy-looking shoots. Six weeks later, when the resultant plants were photographed, the mean height of foliage in Nos. 1 and 2 was found to be 15 in; in Nos. 3 and 4, 18 in.; No. 5, 27 in.; and in Nos. 6 and 7, 15 in.

Nos. 1 to 5 had produced collectively eight shoots, and Nos. 6 and 7 five shoots; the average height of foliage for the five treated pots being 10 in., as against 7.50 in. for the two controls.

This seems to indicate that cane plants may perhaps derive benefit from absorption by their roots of minute quantities of copper salts; since it is a well-known fact that, in many cases, we are able to artificially stimulate plant growth by an application to the soil of weak solutions of copper sulphate. In the above experiment, all seven pots received the same measured quantity of water, sufficient to nicely moisten but be wholly absorbed by the earth, thus precluding drainage and possible loss of fine particles of the soil or arsenic. Artificial manure, consisting of a little nitrogen and potash, was given at intervals in the water, each pot receiving exactly the same amount.

The result conveyed by the foregoing figures merely confirms previous opinions with reference to Paris Green stated in last month's report.

The quantity per acre advocated in Bulletin No. 4 of this Bureau—in connection with cane grub control by means of poison baits—was only 8 lb., whereas it appears probable that at least 226 lb. per acre can, if desired, be administered to the soil in this way without causing injury to the cane.

Other experiments with Paris Green yielded results practically identical with that given above, so need not be referred to in detail. I may mention, however, that the cane growing in a number of 7-in. pots is higher at present in those treated with copper arsenate than in the controls, and finest of all in one containing cowpea leaves that had been dusted with the arsenical mixture at the rate of 113 lb. per acre.

This experiment was started on the 1st November, and five weeks later (5th December) foliage in these ten pots averaged about 18 in. in height.

As regards the action of commercial white arsenic, cane "sets" were planted, on 4th October, in half a dozen 10-in. flower pots, and when photographed, after a lapse of six weeks, the average height of cane leaves in those containing soil infected at rates of from 100 to 200 lb. of arsenious acid to the acre was found to be 27.80 in., while in a single pot, used as a control, the height was 26 in. All plants appeared equally healthy throughout the course of this experiment. Outdoor tests were limited to an application of copper arsenate to the roots of two months old plant cane growing near the laboratory, the poison being simply dusted over damp cowpea leaves, which were then buried about 6 in. deep on each side of the stools and 8 in. from the centre of the row. Plants treated in this way continued healthy, and developed in a normal manner. Five weeks later, when the soil was examined, the treated cowpea foliage was easily located owing to its conspicuous green hue, but had, of course, partially decayed. The rainfall experienced during the course of the above test was only 112 points, all of which fell on the 7th instant, about a week after burial of the poisoned leaves.

The primary emergence of our grey-back cockchafer was noted by Mr. J. Clarke, of Highleigh, on the 7th instant, and at Meringa a week later. Several experiments were initiated this month in order to determine approximately the duration of the egg stage of albohirta under both normal and adverse climatic conditions.

On the 27th a collection of these beetles was procured from the former locality (Highleigh), and twenty female specimens confined separately in cages of damp soil.

When examined after an interval of four days (twenty-three days after emergence), fourteen out of the twenty beetles had, between them,

laid 318 eggs, and the remaining six were constructing earthen chambers in which to oviposit.

Half a dozen females derived from the abovementioned collection, but placed on the same date in cages containing dry soil, did not lay; and ultimately, upon dying, four of them were found by dissection to contain eighty-four full-sized eggs fit for exclusion, and varying in individuals from ten to thirty in number. The ovaries of the other two were small and apparently unfertile.

We may, I think, reasonably assume from the foregoing evidence that the simultaneous desire to oviposit manifested by the former batch of twenty beetles was induced by the ideal conditions of soil-moisture artificially provided for them; and, moreover, that the ovary in these insects had in most cases attained full development prior to the date of capture, but oviposition had been purposely postponed owing to abnormal dryness of the soil.

It is hoped to deal more fully with this matter in a later report, but I may state that, apart from any scientific interest it may possess, these investigations have, up to the present, resulted in discoveries of more or less economic value in connection with the control of the egg stage of *Lepidiota albohirta*.

PEARLS IN COCOANUTS.

In 1911, the then Governor of Queensland (Sir William MacGregor) obtained from Mr. T. A. Williams, of Sabai Island, Torres Strait, valuable information on the subject of the diameter of space to which root cords spread out from the base of cocoanut trees, and courteously handed the report to us for publication. This appeared in the October issue of the Journal, 1911.

Whilst discussing the root question, His Excellency informed us that in Hawaii (or Fiji?) he had been handed a cocoanut for his refreshment, and that he found inside it a valuable pearl. He saw the cocoanut opened, and was quite sure the pearl was not dropped into it. He gave the pearl to a lady present, who afterwards wore it at some Court function in London. Singularly enough, to-day we find in a book on "Tropical Agriculture," by H. A. Alford Nicholls, M.D., F.L.S., C., M.Z.S., &c., the following remarkable confirmation of the existence of pearls in cocoanuts. The author says, when describing the various parts of the nut: "Finally, a very singular and highly-prized pearl is found, under very rare circumstances, in cocoanuts, and a specimen has lately been added to the Museum of the Royal Gardens at Kew (1892)."

Forestry.

FORESTRY IN HAWAII.

The Forestry Department in Hawaii announces that the Division of Forestry would have ready for distribution, about December last, several thousand young trees of the Australian red cedar, *Cedrela australia,* which it desires to have planted out in as many different situations as possible in order to test its adaptability to the Hawaiian Islands. In connection with this, the "Hawaiian Forester and Agriculturist," of October, 1916, writes:—

"This is a timber tree which promises to be of great value to the Territory. Its distribution has been made possible by the gift of a quantity of seed which Mr. A. W. van Valkenburg and Mr. C. E. Smith kindly turned over to this Division and which Mr. Smith personally selected and gathered recently in Australia.

"The timber of the Australian red cedar is considered the most valuable produced in New South Wales, and it is in universal use there. The tree is found growing naturally in Queensland and New South Wales, especially in the warmest and moistest districts between the latitudes of 35 degrees and 20 degrees south. It grows best in protected places where there is a little shade. The tree is easily transplanted, is a rapid grower, and in Australia attains a height up to 200 ft., with a diameter up to 10 ft. The size of the average tree now being cut in Australia is about half of the above.

"The wood of the Australian red cedar is equal to mahogany but lighter in weight. It is used for many of the same purposes—for tables, cabinets, furniture, doors, and interior finish, and it is excellent for carriage-building, because it is light and easily worked. It seasons well with very little splitting, and is very durable when kept dry.

"The Division of Forestry will be glad to place a number of these trees in the hands of tree planters who will be willing to set them out in suitable situations, care for them, and report on their growth in after years. Orders for these trees will be gladly received from those who are willing to do this and who have not already received special notification that these trees will be available for distribution."

SOME USES OF HONEY.

Honey for Cleansing the Hands.—Honey is an excellent cleanser of the skin, though few are aware of the fact. Try this: Rub a little honey on the dry skin; moisten a little, and rub again; use more water, and rub. Wash thoroughly, when it will be found that the hands are as clean as the most powerful soap can make them.

Honey for Freckles.—Half a pound of honey, 2 oz. glycerine, 2 oz. alcohol, 6 drams citric acid, 15 drops ambergris. Apply night and morning.

Entomology.

THE CANE BEETLE.

The General Superintendent of Sugar Experiment Stations has received the following report from Mr. Edmund Jarvis, Entomologist to the Bureau: —

With further reference to experimentation relating to the egg stage of our principal cane-beetle—alluded to in last month's report—it will be of interest to record the following data just obtained at Gordonvale Laboratory.

Dealing firstly with the method of oviposition as practised by the grey-back beetle (*Lepidiota albohirta*, Water.), I may state that the depth at which its eggs are deposited depends naturally to a great extent upon the amount of moisture contained in the soil at the time, which, however, needs to be sufficient to keep the ova thoroughly damp during a period of at least two weeks.

Under normal weather conditions this species most likely oviposits in the field at a depth of about 6 in.

Practically all of the seventy-three female specimens confined in moist soil at the laboratory this month oviposited at the bottom of their cages, where the earth had been made wetter and firmer than elsewhere. Those laying large batches of eggs usually constructed a chamber of irregular shape, about an inch in diameter, the sides of which were firmly compacted—in order, no doubt, to prevent the interior from becoming filled with soil, that if coming into close contact with the comparatively soft ova would interfere with their proper expansion. This cavity, however, generally contained a good deal of loose earth, introduced most likely owing to disturbance of the outer soil by the insect as it crawled from the spot after having laid its eggs.

These are placed in a flattened mass on the floor of the chamber, and may be deposited either separately or attached to each other in short strings of two or more, or connected groups consisting of as many as seventeen (so far as observed), but are usually laid singly and nearly always intermixed with small particles of soil.

At the time of deposition, the egg is about 4.25 mm. long—twelve this size placed end to end in a straight line measuring exactly 2 in.—but during development gradually swells, until just prior to hatching it is fully a quarter of an inch in length (6.30 mm.).

Being of a creamy-white colour, these large oval-shaped eggs are necessarily conspicuous when occurring in dark soils.

With regard to the number that may be produced by a single specimen of albohirta, it is interesting to be able to state that results just obtained verify the correctness of previous opinions in this connection recorded last January ("Australian Sugar Journal," Vol. VII., p. 902).

Judging by numerous dissections made at that time, I concluded, from the structure of the ovarian tubes, that an individual beetle, although often laying from twenty-four to thirty eggs, was capable of

producing as many as three dozen—a number, by the way, much in excess of that given by other entomologists, who have stated the maximum to be twenty-four or twenty-five.

During the present season, however, a female of this species caged at the laboratory actually deposited, on the 8th instant, a batch of thirty-six eggs, and from the ovary of another specimen a similar number was taken, fully grown, and almost fit for exclusion. In addition to the above high record it may be mentioned that two beetles laid thirty-four eggs each; while other lots—obtained from chambers formed in cages of damp earth—comprised eight batches of thirty eggs; three of twenty-nine; one of twenty-eight; one of twenty-seven; seven of twenty-six; three of twenty-five; and eight of twenty-four.

The seventy-three females used in the above experiments produced altogether 1,537 eggs (21·5 per insect), and as all specimens laying less than fifteen were examined after death and the ovaries found empty, we may assume this average to be fairly correct. When laying twenty or less, the individual eggs in such lots are generally a little larger at the time of deposition than those taken from chambers containing twenty-five to thirty-six. Among batches of thirty to thirty-six, it is not unusual to find two or three much smaller than the rest.

Regarding the duration of the period preceding oviposition, recent experiments incline me to believe that *Lepidiota albohirta* deposits only one large batch, which—in the event of emergence being followed by continuous dry weather—most likely includes every egg it is able to lay. On the other hand, should this interval prove more or less showery, oviposition may, and no doubt frequently does, take place as soon as each of the twelve ovarian tubes forming the ovary contain two fully grown eggs. Under the latter climatic conditions, maternal instincts would naturally prompt the female to take advantage of the presence of abundant moisture in the soil; thus we may reasonably assume that the batch of twenty-four so often met with, consisting of eggs that usually mature simultaneously, would, under such circumstances, be laid first; while the remaining supplementary twelve, which apparently constitute a sort of reserve supply and do not attain full development until some days later, would be deposited at random either singly or in small numbers as opportunity might offer. For example: The seventy-three beetles abovementioned chanced to experience a dry spell after emerging from the ground, and, egg-laying being delayed in consequence, deposited the whole contents of the ovary in one large batch; while in no instance did a specimen subsequently yield additional ova, although living for several days longer subjected to the same congenial environment.

With reference to the influence of parasites in this connection, it was noticed that a grey-back beetle, harbouring a single maggot of one of the smaller parasitic flies, managed, notwithstanding, to mature and deposit fourteen eggs about twenty days after emergence, and did not succumb until six days later.

Another containing a large dexiid grub and a third specimen infested with nine dipterous maggots lived for nearly three weeks, but were unable to oviposit.

THE MAGGOT-FLY.

By W. G. BROWN, Instructor in Sheep and Wool.

On a recent trip to the South I found pastoralists, and even the authorities on the above matter, in despair as to finding a method of destroying maggots or preventing the infestation of sheep by the fly. It is the same thing here in Queensland. It has seemed to me for years that the problem has been tackled at the wrong end. It seems obvious that if the fly can be destroyed then no palliatives will be required; yet it is safe to say that nine hundred and ninety-nine people in a thousand who are interested in the matter, and who have fly-stricken sheep, are looking for something which will either destroy the maggots or minimise their effects.

Until this year, in the very great majority of cases, it was known that the fly did not blow sheep with less than two months' wool. In the middle of November last year, on the Downs, I saw newly shorn sheep blown on the neck, in the ears, and in wrinkles; in fact, all over the body. At the same time, on walking through the paddocks, it was to be seen that almost every blade of grass and the stems of the various shrubs or weeds were literally swarming with flies, many of which were the red-headed blue fly or the common green fly, both of which are reputed as being addicted to striking the sheep.

What chance has any sheep of escaping if the paddocks be full of flies? The cost of palliatives by this time (from 1902) must have run into hundreds of thousands of pounds, and the losses of sheep and wool quite incalculable. Therefore, if we are to do anything to lessen the losses, it seems that the fly itself must be tackled; and, while that is being done, we can use the palliatives, such as they are, in the hope that something may be discovered which will deal with the fly in a wholesale manner.

Here is a suggestion which comes from a well-known pastoralist, and it seems so reasonable that I thought it well to put it on paper. We have the prickly-pear pest, and many methods have been used to kill it wholesale. Amongst the methods is the use of a gas heavier than air, and which is poisonous. This seems to kill pear wherever I have seen it tried.

Our soldiers at the front, too, are liable to be killed with a gas heavier than air. Now, if pear or human beings can be killed by such a gas in a wholesale manner, it seems quite reasonable that all these flies may be killed also, and our chemists should be able to find such a gas.

To apply it, the animals could be removed from a paddock, placed in high country, or at the back of the gas-holders, and then a stream of poisonous fumes allowed to flow over the country.

Even if the sheep should have to be removed from the district for a time, it is no more than happens if water or feed fail in bad seasons. Details, of course, would have to be left to the chemists; but surely if human beings and prickly-pear can be destroyed in such a manner, flies are not immune.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RETURNS OF COWS FROM 27TH DECEMBER, 1916, TO 26TH JANUARY, 1917.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Violette's Peer's Girl	Jersey	13 Dec., 1916	629	6·4	47·73	
Iron Plate ...	,, ...	9 Dec. ,,	737	4·6	39·94	
Miss Edition	,, ...	25 Dec. ,,	777	4·1	37·42	
Sweet Meadows	,, ...	18 Aug. ,,	490	6·0	34·82	
Nina ...	Shorthorn... ...	23 June ,,	729	3·9	33·36	
Jeannie ...	Ayrshire	27 Oct. ,,	651	4·3	32·94	
Comedienne	Jersey	24 Nov. ,,	557	5·0	32·88	
Miss Bell ...	,, ...	1 Aug. ,,	496	5·3	32·06	
Lady Margaret	Ayrshire	8 Jan., 1917	580	4·5	30·74	
Queen Kate	,, ...	15 June, 1916	683	3·8	30·42	
Twylish's Maid	Jersey	2 Nov. ,,	536	4·8	30·34	
Bluebelle ...	,, ...	22 June ,,	580	4·4	30 04	
Lady Dorset	Ayrshire	14 Sept. ,,	668	3·8	29·75	
Lilia ...	,, ...	4 Sept. ,,	543	4·4	28·11	
Princess Kate	,, ...	20 June ,,	508	4·6	27·53	
Charity ...	Jersey	28 May ,,	393	5·8	26·98	
Constancy ...	Ayrshire	27 Dec. ,,	673	3·4	26·73	
Lady Annette	,, ...	11 Nov. ,,	708	3·2	26·42	
Rosine ...	,, ...	6 July ,,	570	3·9	26·09	
La Hurette Hope	Jersey	6 Oct. ,,	498	4·3	25·19	
Thornton's Fairetta	,, ...	26 May ,,	498	4·0	23·38	
Skylark ...	Ayrshire	21 March ,,	440	4·4	22·79	
Netherton Belle	,, ...	11 March ,,	372	4·9	21·49	
Lady Loch II.	,, ...	17 March ,,	391	4·6	21·18	
Glen ...	Shorthorn... ...	8 Jan., 1917	415	4·2	20·48	

The above cows were fed on natural pasture only.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—BEEF AND DAIRY CATTLE.

The following list of breeders in Queensland of purebred cattle is published for the purpose of informing those who desire to improve their stock where the best cattle can be obtained in this State. The Department of Agriculture and Stock undertakes no responsibility in relation to the entries in the list; but, when making inquiries, the condition was imposed that the entries were to be comprised only of the stock that had been entered in a herd book or are eligible for entry.

The list as now published is incomplete; it includes the information received to date, and will be added to from time to time. Any owner desiring to have his stock included, should notify the Under Secretary of the breed of purebred stock he owns, the number of males and females entered or eligible for entry in a herd book, and the herd book in which they are entered.

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
AYRSHIRES.				
Queensland Agricultural College	Gatton	14	45	Ayrshire Herd Book of Queensland
State Farm	Warren, Rockhampton	9	88	ditto
H. M. Hart	Glen Heath, Yalangur	6	15	ditto
L. H. Paten	Jeyandel, Calvert ..	8	20	ditto
J. H. Paten	Yandina	8	23	ditto
J. H. Fairfax	Marinya, Cambooya	9	55	ditto
State Farm	Kairi	4	8	ditto
F. A. Stimpson ..	Ayrshire Stud Farm, Fairfield, South Brisbane	17	68	ditto
J. W. Paten	Wanora, Ipswich ..	10	42	ditto (Includes 29 cows in advanced register.)
JERSEYS.				
W. Siemon & Sons Ld.	Roma st., Brisbane ..	6	60	Queensland Jersey Herd Book
Queensland Agricultural College	Gatton	13	30	ditto
W. J. Barnes	Cedar Grove ..	10	27	ditto
W. J. Affleck	Grasmere, N. Pine ..	6	31	ditto
M. W. Doyle	Moggill	4	12	ditto
State Farm	Kairi	6	40	ditto
James T. Turner ..	The Holmwood, Neurum	1	5	ditto
Robert Conochie ..	Brookland Jersey Stud Farm, Brooklands, Tingoora	9	21	ditto
G. A. Buss	Bundaberg	5	14	ditto
T. V. Nicholson ..	Windsor	2	8	ditto
Geo. H. Crowther ..	Montrose, Oakey ..	7	43	ditto
E. F. Fitzgibbon ..	Listowel, Oakey ..	7	30	ditto
GUERNSEYS.				
Queensland Agricultural College	Gatton	2	2	Eligible but no Herd Book in Queensland
HOLSTEINS.				
Queensland Agricultural College	Gatton	3	10	Holstein-Friesian Herd Book of Australia
George Newman ..	Wyreema	9	37	ditto
F. C. G. Gratton ..	Towlerton, Kingsthorpe	2	11	Eligible for entry in Holstein-Friesian Herd Book of Australia
State Farm	Kairi	1	2	ditto
R. S. Alexander ..	Glenlomond Farm, Columboola	3	1	Holstein Friesian Herd Book of Australia
S. H. Hosking ..	Racing Plains, Toogoolawah	2	23	ditto
C. Behrendorff ..	Inavale Stud Farm, Bunjurgen, *via* Boonah	5	10	ditto

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
ILLAWARRA.				
John Hardcastle ..	Dugandan	5	17	Illawarra Herd Book of Queensland
Hunt Bros.	Maleny	3	62	ditto
W. F. Savage ..	Ramsay	2	29	ditto
G. E. J. Chaseling ..	Brundah, Coolabunia	1	45	ditto
P. Biddles	Home Park, Netherby	3	14	ditto
A. N Webster ..	Yaralla, Maleny ..	5	65	ditto
A. Pickels	Blacklands, Wondai	4	82	ditto
MILKING SHORTHORNS.				
A. Rodgers	Torrans Vale, Lanefield	3	18	Milking Shorthorn Herd Book of Queensland
Wm. Rudd	Airedale, Christmas Creek, Beaudesert	6	30	ditto
W. Middleton	Devon Court, Crow's Nest	3	27	ditto
P. Young	Talgai West, Ellinthorp	11	60	ditto
BEEF SHORTHORNS.				
T. B. Murray-Prior ..	Maroon, Boonah ..	..	17	Queensland Shorthorn Herd Book
T. B. Murray-Prior ..	Maroon, Boonah ..	2	20	Australian Herd Book
HEREFORD.				
H. F. Elwyn	Gunyan, Inglewood	250	750	Australian Hereford Herd Book
Mrs. Lumley Hill ..	Bellevue	45	127	Entered or eligible for entry A.H.H.B.
James T. Turner ..	The Holmwood, Neurum	25	50	Australian Hereford Herd Book
A. J. McConnel ..	Dugandan, Boonah	43	60	ditto
ABERDEEN ANGUS.				
G. C. Clark	East Talgai, Ellinthorp	4	10	Entered or eligible for N.Z.H.B.
SHORTHORN.				
C. E. McDougall ..	Lyndhurst, Warwick	25	50	Entered or eligible Q.H.B.
W. B. Slade	East Glengallan, Warwick	77	283	Queensland Shorthorn Herd Book
W. T. Scrymgeour ..	"Tara," Arthur st., Toowoomba	79	300	ditto
SUSSEX.				
James T. Turner ..	The Holmwood, Neurum	2	4	Sussex Herd Book

PEPSIN V. RENNET.

The following particulars concerning the investigation in connection with the manufacture of pepsin for cheesemaking in view of the shortage of rennet, the export of which has been prohibited by war regulations in Europe, have been supplied by the hon. secretary of the Queensland Committee of the Commonwealth Advisory Council of Science and Industry, and they go to show that the results of the use of pepsin are more than equal to those obtained by rennet. It appears that pepsin costing 1¾d. will go as far as rennet costing, to-day, 1s.:—

"The average annual production of cheese in the Commonwealth from 1910 to 1915 was 18,097,424 lb. Assuming 1 lb. of pepsin is required for 9,000 lb. of cheese, 2,019 lb. of pepsin would be required to supply the whole Commonwealth if pepsin entirely displaced rennet in cheesemaking. The normal price of pepsin is usually £1 1s. per lb. This would mean that the maximum value of the industry would be worth, say, £2,200. It seems probable that at least another ton of pepsin would be utilised for the manufacture of peptonised foods, &c.

"There is no doubt that pepsin can be made here, and that it would have been produced locally if sufficient inducement were forthcoming. Mr. F. E. Trollope, formerly chemist to the Bovril Company, London, and to Angliss and Co., Melbourne, states that he has extracted high-grade pepsin from stomachs of both hogs and sheep, and that there are no technical difficulties in the extraction. According to Mr. Trollope, 1 ton of sheep's stomachs will give 2 per cent., or 45 lb., of pepsin; consequently, approximately, 50 tons of stomachs would be required to produce 1 ton of pepsin. The pepsin is at least twenty times as strong as rennet extract, and 5 grams of pepsin will coagulate as much milk as 3½ to 4 oz. of rennet extract. If rennet in normal times is worth 10s. per gallon, pepsin is worth £1 per lb. Rennet recently was sold at £4 15s. per gallon, and is unobtainable even at that price.

"The sheep's stomachs utilised for making the pepsin are at present made into fertiliser, and for that purpose are worth about £4 per ton. As 50 tons would be required for the manufacture of 1 ton of pepsin, the raw material for a year's supply of pepsin would be worth £200. The material could still be utilised for fertiliser purposes after the rennet is extracted, so that the actual cost of raw material would be at the outside £40. The labour required would be an experienced chemist and an assistant registered as boiler attendant. The plant (irrespective of building) would be a boiler for steam and connections, vacuum pan and pump, wooden vats, drying oven, dialysers, laboratory apparatus for testing and standardising pepsin, and a grinding mill, making a total cost of about £750."

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, DECEMBER 28, 1916, TO JANUARY 27, 1917.

Eight thousand nine hundred and ninety-four eggs were laid during the month, an average of 123·2 per pen. The heat wave from the 10th to the 12th, inclusive, was one of the worst we have experienced here. The temperature (106 degrees) was not so high as we have had it on previous occasions, but the accompanying humid atmosphere made it very oppressive. Every attention was given to throwing about water in the houses, with the result that we lost one bird only, a Black Orpington owned by Mr. Fanning. The laying, however, was considerably checked; many birds have stopped altogether and are going into moult. Geo. Tomlinson wins the monthly prize with 154 eggs. The following are the individual records:—

Competitors.	Breed.	Dec.	Total.
*J. Zahl	White Leghorns	118	1,301
*Miss M. Hinze	Do.	124	1,282
*T. Fanning	Do.	115	1,277
*A. T. Coomber	Do.	128	1,270
*J. M. Manson	Do.	124	1,266
W. Meneely	Do.	143	1,260
G. H. Turner	Do.	126	1,250
Geo. Tomlinson	Do.	154	1,247
J. R. Wilson	Do.	134	1,245
A. Howe, N.S.W.	Do.	105	1,214
Dr. E. C. Jennings	Do.	124	1,204
*E. A. Smith	Do.	139	1,199
*A. E. Walters	Do.	138	1,194
*E. F. Dennis	Do.	132	1,187
J. M. Manson	Black Orpingtons	116	1,175
Mrs. Munro	White Leghorns	136	1,174
Mrs. W. D. Bradburne, N.S.W.	Do.	132	1,166
*Dixie Egg Plant	Do.	123	1,160
A. W. Bailey	Do.	136	1,158
Geo. Prince	Do.	128	1,151
*J. H. Gill, Victoria	Do.	140	1,147
T. Taylor	Do.	127	1,146
W. Lyell	Do.	133	1,145
H. W. Broad	Do.	134	1,138
*W. H. Knowles	Do.	137	1,135
Kelvin Poultry Farm	Do.	116	1,130
A. H. Padman, S.A.	Do.	152	1,130
T. E. Jarman, N.S.W.	Do.	127	1,129
E. Pocock	Do.	143	1,128
*J. F. Dalrymple, N.S.W.	Rhode Island Reds	124	1,128
*Mrs. J. H. Jobling, N.S.W.	Black Orpingtons	87	1,127
T. B. Hawkins	White Leghorns	112	1,121
F. Clayton, N.S.W.	Do.	139	1,118
W. Purvis, S.A.	Do.	128	1,114
P. Brodie	Do.	128	1,113
Cowan Bros., N.S.W.	Do.	145	1,108
Mars Poultry Farm	Do.	135	1,104
*C. Knoblauch	Do.	126	1,104
A. F. Camkin, N.S.W.	Do.	137	1,100
R. Burns	S. L. Wyandottes	124	1,098
J. Anderson, Victoria	White Leghorns	138	1,094
*E. West	Do.	116	1,090

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	Dec.	Total.
E. F. Dennis	Black Orpingtons ...	134	1,088
H. Jobling, N.S.W.	Do.	115	1,081
T. Fanning	Do.	130	1,080
King and Watson, N.S.W.	White Leghorns ...	130	1,076
Mrs. C. Davis	Do.	113	1,075
Cowan Bros., N.S.W.	Black Orpingtons ...	117	1,068
W. Becker...	White Leghorns ...	135	1,061
G. W. Holland	Do.	150	1,058
A. Hirst, N.S.W.	Do.	126	1,047
*W. L. Forrest, N.S.W....	White Leghorns ...	106	1,044
*Kelvin Poultry Farm	Do.	90	1,043
J. G. Richter	Do.	121	1,031
Mars Poultry Farm	Black Orpingtons ...	128	1,026
C. P. Buchanan	White Leghorns ...	105	1,023
S. B. Tutin	Do.	92	1,009
F. Clayton, N.S.W.	Rhode Island Reds ...	109	1,002
R. Burns	Black Orpingtons ..	119	996
*J. H. Madrers, N.S.W.	Rhode Island Reds ...	100	983
*J. W. Macrae	Black Orpingtons ...	100	977
Moritz Bros., S.A.	White Leghorns ...	131	968
H. Hammill, N.S.W.	Do.	143	967
Harveston Poultry Farm	Do.	129	960
J. Gosley	Do.	97	951
F. W. Leney	Do.	118	937
W. Lindus, N.S.W.	Do.	124	936
*J. Anderson, Victoria	Red Sussex	80	924
L. K. Pettit, N.S.W.	White Leghorns ...	113	906
W. H. Forsyth, N.S.W.	Black Orpingtons ...	84	879
A. T. Coomber	Sicilian Buttercups ...	107	861
F. W Leney	Rhode Island Reds ...	110	829
E. F. Dennis	White Wyandottes ...	115	770
Totals	...	8,994	79,683

* Indicates that pen is taking part in single hen test.

RESULTS OF SINGLE HEN TEST.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
J. Zahl	211	227	216	216	222	209	1,301
Miss M. Hinze	220	195	241	196	223	207	1,282
T. Fanning	227	225	226	219	195	185	1,277
A. T. Coomber	218	226	221	189	192	224	1,270
J. M. Manson	192	244	201	204	228	197	1,266
E. A. Smith	222	217	195	222	171	172	1,199
A. E. Walters	207	232	194	180	208	173	1,194
E. F. Dennis	186	221	170	227	202	181	1,187
Dixie Egg Plant	246	229	237	225	...	223	1,160
J. H. Gill	168	195	189	222	190	183	1,147
W. H. Knowles, junr.	179	181	195	168	213	199	1,135
J. F. Dalrymple	178	187	202	156	220	185	1,128
Mrs. J. H. Jobling	179	239	171	182	169	187	1,127
C. Knoblauch	166	199	180	172	192	195	1,104
E. West	220	199	166	170	152	183	1,090
W. L. Forrest	209	208	52	173	210	192	1,044
Kelvin Poultry Farm	169	167	159	161	221	166	1,043
J. H. Madrers	128	193	192	185	145	140	983
J. W. Macrae	136	202	178	177	138	146	977
J. Anderson	171	144	197	91	183	138	924

RANGEVILLE STATE SCHOOL, TOOWOOMBA.

Mr. Thos. Henderson, head teacher of the Rangeville State School, Toowoomba, sends in the following interesting account of rural studies and practical utility work in which his pupils are instructed. It is worthy of note that many of the State school teachers—as, for instance, Mr. R. G. Bartlett, head teacher of the State school, Budeiim Mountain and others—are doing excellent work in instructing the pupils in various branches of rural industries, which work cannot fail to be of much benefit to the latter and incidentally to the State.

"In conjunction with the practical nature study work carried on by the boys and girls of Rangeville School, it was decided to add poultry-keeping from a utility point of view. Several well-known breeders—Messrs. Parker and Smith, of Brisbane, and Becker, of Toowoomba—presented the school with a pen of six White Leghorn pullets. These three breeders each have a pen competing in the Gatton College laying competition. Mr. F. A. Robinson, of Toowoomba, also presented two roosters—one of pure Padman blood and one by a Yangarella cockerel from Padman hens. The manager of Yangarella Yards also presented a pure Padman bird. Mr. Becker's pen is housed in a Philo summer coop, and the pens of Messrs. Parker and Smith are each in a pen 6 ft. square and about 6 ft. high on a semi-Gordon system.

"Horse manure is used for scratching material. The ammonia in the manure keeps the birds free from vermin. The fowls are attended to entirely by the children, whose ages range from nine to thirteen years. The monitors are changed weekly, two boys looking after each pen, and two girls attend the chickens, which are housed in a Philo chicken-coop, and sleep in a fireless brooder. This system of changing the monitors gives every child an opportunity of personally attending to the fowls. The birds are fed on dry mash, which is always in hoppers before them. Grain is given in the evening and dug into the scratching material to make the birds work for their food. Dried blood is used as a substitute for animal food. Green feed is given daily, and is suspended in the air by a wire from the roof. Salts are given once a week in the drinking water. The houses are cleaned daily.

"As well as being educational to the children, the object is also patriotic. There is a hospital ('Finchley') at Toowoomba for wounded soldiers, and many who are incapacitated for hard labour could make a living from poultry-raising, and a visit to the school shows them two systems of running the birds. Settings also, free of charge, will be supplied to those wounded soldiers who intend to go in for poultry-raising.

"The scholars are keenly interested in this new branch of nature knowledge, and are all anxious for their turns to act as monitors.

"The following are the numbers of eggs laid by the respective pens for the month of October:—Mr. Smith's birds got a bad start off, but now seem to have settled down to business; Mr. Parker's pen (Mars Poultry Farm), laid 138 eggs; Mr. Becker's pen, 122 eggs; Mr. Smith's pen, 112 eggs."

A TOWERS POULTRY FARM.

We are indebted to Mr. J. W. Ward, Charters Towers, for the following description of a thriving poultry farm near the Weir at that town, owned and conducted by Mrs. Rose, and her young son and daughter. The success which has been achieved by her should surely be an incentive to others to go and do likewise:—

"In travelling to the Weir at Charters Towers one would not think for a moment that they passed within a quarter of a mile, at most, of one of the most up-to-date poultry farms in Queensland. This writer has certainly not seen anything like it this side of Petuluma, near San Francisco, California. Some two or more years ago I called on the then owner, Mr. Pass, of the Defiance Poultry Farm, and in looking around I complimented him upon his up-to-date stock and method. I said, 'Man, you must do well. I am sure nobody in this district knows what a fine little concern you have here.' Mr. Pass replied, in his short curt way, 'No; and neither do I want them to know until I have my plant and stock complete.' He requested me at that time never to mention his farm in the Press, or to outsiders, until he gave me permission. That request has been kept sacred until recently. Since then the farm has changed hands, and is now owned by Mrs. Rose, and, with her permission, I now write you of this well-kept, up-to-date model hen farm.

"Mrs. Rose, with the help of her boy and girl (when not at school), looks after and feeds anything from 700 to 1,000 fowls, besides some 900 to 1,200 young chickens of all ages, from four days to several weeks old. Could anyone imagine a woman looking after three incubators, hatching anything from 75 to 100 chickens at a time and taking care of these young chicks in their different foster-mother homes. Why, it is quite a sight to see 80 to 120 little toddlers running around in their little foster-mother coops, when feeding time comes, and when the feeding is over to watch these little chicks running into an adjoining coop where a kerosene lamp is burning in a kerosene tin, giving off heat to keep them warm at nights; and then as they grow older they are passed out into the larger enclosure, later to be separated, the males from the females—the one (male) to go out on to the table, and the female to keep up the process of egg supplies.

"It is indeed an interesting subject, and to visit this farm is quite an eye-opener to those who have not been there before. It has been my lot within recent months to take visitors to see the farm, and they have come away surprised at what was seen.

"Quite recently Mrs. Rose has sold over 300 of her hens, at prices varying from 5s. to 7s. 6d. each. They are the White Leghorn variety, and prize fowls, coming from a 245-egg strain. Just imagine a well-looked-after hen giving from 200 to 300 eggs per annum, and one can safely say the product will average at least 1s. 6d. per dozen all the year through. There is no doubt these fowls are well looked after, and the

corn and wheat is ground or crushed so that everything is made easy for them.

"Herein is an object lesson of what can be done in this district. Here we have two 40-acre homesteads, two horses, two carts and harness, five incubators, two decent cottages, windmill, pumps, and plant. The fenced-off hen-runs have their little coops in each enclosure. Mr. Rose and Mr. Pass have taken up an island named Phantom Island, near Palm Island, where they are now planting fruit trees as well as getting ready to go into fowl-rearing in a much bigger way than locally. In addition to the plant mentioned above, 700 laying hens, giving at the very least 200 dozen per week worth at least 1s. 6d. per dozen, besides the fowls to be disposed of, and anything from 800 to 1,200 young chicks varying from a few days to a few weeks old.

"This is but one more self-evident and concrete case, showing what can be done with application and ambition to push on and make a success of things. The little farm under consideration, a few years ago, was commenced with just a few fowls, and has grown to quite decent dimensions, and there is no earthly reason why we should not have more of these places around us. There is any amount of room for development. Only within the last month a representative of a Townsville firm was here quite ready to buy out all the eggs and all the fowls at the Defiance Fowl Farm.

"Western Queensland takes quite a large number of eggs. Townsville imports from South, and there is quite a good opening for the egg and hen industry here. This industry in the United States is the very biggest industry they have, running into hundreds of millions annually, and even in the Southern portion of Queensland it is getting quite a big business. Eggs can be bought South at about 8½d. to 10d. per dozen at the present time, and yet there is a plentiful market here at 1s. 3d. per dozen, and then supplies are short.

"Here we have a calling or industry quite suitable for women, and yet so little of it is done. Even we are so far away from the centre of government that the heads of the departments never care whether the people at great distances from the seat of government learn anything or not. Neither the fowl experts nor any other experts call here, except for a passing visit; they are here to-day and gone to-morrow—not as in Southern Queensland, when they are sent out during the week and come home for week ends.

"One fact stands out boldly—that there are other means of getting a decent livelihood rather than running around looking for a boss at so much per week. All that is needed is men and women with a bit of pluck and ambition to strike out for themselves. Our community would be the better for such, and much real progress from a wealth-producing point of view would soon be seen if men and women could be induced to try and make a success of getting wealth from the surface of the land."

General Notes.

FEEDING PIGS: A STARTLING STATEMENT.

A somewhat startling statement appeared in one of our exchanges (says the "London Live Stock Journal"). It is as follows:—"Lewes and Gilbert, at Rothamsted, in a ten weeks' feeding trial with pigs weighing 135 lb. each and feeding to a weight of 275 lb., found at the start 386 lb. of food provided 100 lb. of live weight. At the end of four weeks 502 lb. were necessary, and in the ninth and tenth weeks 610 lb."

This is an extraordinary result, if it be correct, as it shows that more than twice as much meal was required to produce 1 lb. of meat by a pig weighing about 250 lb. than could be manufactured by the same pig when it weighed about half the weight some nine weeks previously. Should this be proved in general practice to be true, how great an advantage has a young pig in the manufacture of meat over one of more mature age after a period of good living!

The question arises, have our specialists given sufficient attention to the more profitable system of fattening our pigs to light weights when they are young?

A USE FOR SURPLUS PLUMS.

PLUM WINE.

The "Farmer and Settler," Sydney, writes: "Plum wine is easy to make on the farm," and gives the following simple recipes:—

Now that plums are in season, and some farm folk have more than they can use as jam or bottled fruit, they may like to experiment with plum wine, using the following recipes recommended by the New Zealand Department of Agriculture:—

Dry Plum Wine.

Place plums in a copper or enamel jam-making bowl and cover with water. Boil, and when boiling simmer for half an hour; strain into wooden vessels (casks for preference). Add ½ lb. to ¾ lb. of good sugar to each gallon of liquid and allow to ferment until dry—*i.e.*, until all the sugar has disappeared. Then allow to stand for seven days, after which rack the clear liquid off into another vessel, and allow it to stand for another fortnight. Then rack again and bung the cask up airtight. The wine will be ready for use in three to six months.

Sweet Plum Wine.

Proceed as in the making of dry plum wine; but when adding sugar add ½ lb. per day per gallon of juice until 5 lb. per gallon has been added; then allow to ferment. When fermentation is completed, if not sweet enough, add more sugar until the wine is sufficiently sweet to be palatable. Then add 4 oz. of potassium bisulphide per 100 gallons, and 7 gallons of grape spirit—7 gallons grape spirit from 40 o.p. (overproof) to 65 o.p. to be used to every 100 gallons of liquid. This should be ready for use in six to nine months.

These are alcoholic wines, and are therefore too strong for consumption by young people.

DEHAIRING MARSUPIAL SKINS.

Mr. M. J. Gallagher, Kedron Tannery, gives the following recipe to the "Farm Bulletin," 1st December, 1916:—

"Take an empty hogshead and cut in halves. You have now got two pits which will contain about 18 to 20 gallons water each. Half fill one with water, then in the other half slack some lime and pour into the half containing the water. Place the skins in this solution as flat as possible and lift out for a few minutes every day. It will take from six to ten days before the hair is sufficiently loose to scrape off with a blunt knife. Before putting the skins into the lime they will have to be thoroughly soaked and scraped on the flesh several times.

"Use ½ lb. to 1 lb. of lime for each skin according to size; dissolve the lime in half a gallon of water."

COTTON IN THE LIVERPOOL MARKET.

The following are the official "Spot" prices in Liverpool at the end of November, 1916, and on the corresponding dates in 1915, 1914, and 1913:—

—	1916.	1915.	1914.	1913.
"Middling" American	11·42	6·88	4·66	7·42
"Fair" Pernam	12·20N	7·52N	5·12	7·61
"Fully Good Fair" Egyptian ..	20·20N	9·50N	7·20	10·20
"Fine" Broach	10·90N	6.50	4·95	$6\frac{15}{16}$N
"Fine" No. 1 Oomra	8·95N	5·55N	4·25N	$6\frac{7}{16}$N
"Fine" Bengal	8·35N	5·05	3·26	$5\frac{7}{8}$N

Answers to Correspondents.

CATERPILLARS ATTACKING CEDAR TREES.

"B.M.B.," Jundah Station, Cairns—

The caterpillars attacking your cedar trees are, most likely, the larval or caterpillar state of one of the many small moths which attack our forest and other trees. We should be glad to receive specimens of this caterpillar at an early date, to enable us to identify the species. All insects that devour their food can be occasionally combated with any one of the many arsenical prepartions. Paris Green is perhaps the cheapest. In mixing same, place the Paris Green in a cup or billy, add a little water, and mix in the same way as mustard is mixed for table use. Add more water slowly, stirring well all the time. Paris Green should not be used much stronger than 2 oz. to 20 gallons of water (five kerosene tins full). Arsenate of lead is also a good and reliable insecticide, and can be purchased from all seedsmen in tins, on which are full directions for mixing and application. The Paris Green should be sprayed on to the tree in as fine a spray as possible, stirring the mixture to prevent sediment settling to the bottom of the vessel. It is an active poison, and great care should be taken to keep all vessels used in the mixing for that purpose alone, and it should be kept out of the way of children and domestic animals.

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR JANUARY, 1917.

Article.		JANUARY.
		Prices.
Bacon	lb.	9d. to 1s.
Barley	bush.	4s. 3d.
Bran	ton	£5 15s.
Broom Millet	„	£22 to £24
Butter	cwt.	149s. 4d.
Chaff, Mixed	ton	£4
Chaff, Oaten	„	£4 10s. to £5 10s.
Chaff, Lucerne	„	£3 to £3 10s.
Chaff, Wheaten	„	£4
Cheese	lb.	8d. to 8½d.
Flour	ton	£12
Hams	lb.	1s. 3d. to 1s. 4d.
Hay, Oaten	ton	£4 10s.
Hay, Lucerne	„	£1 10s.
Honey	lb.	4d. to 5d.
Maize	bush.	2s. 11d. to 4s.
Oats	„	2s. 6d. to 3s.
Onions	ton	£9
Peanuts	lb.	3d. to 4d.
Pollard	ton	£5 5s.
Potatoes	„	£5 to £5 10s.
Potatoes (Sweet)	cwt.	3s. 6d. to 4s.
Pumpkins (Cattle)	ton	£1 10s. to £2 10s.
Eggs	doz.	9d. to 1s. 4d.
Fowls	pair	4s. to 6s.
Ducks, English	„	4s. to 4s. 6d.
Ducks, Muscovy	„	7s. to 8s.
Geese	„	10s. to 11s.
Turkeys (Hens)	„	12s. to 13s.
Turkeys (Gobblers)	„	18s. to 24s.
Wheat	bush.	2s. 3d. to 3s. 4d.

VEGETABLES—TURBOT STREET MARKETS.

Asparagus, per bundle	...
Cabbages, per dozen	2s. to 6s. 6d.
Cauliflowers, per dozen	...
Celery, per bundle	...
Cucumbers, per dozen	...
Beans, per sugar bag	2s. to 3s. 6d.
Peas, per sugar bag	4s. to 6s.
Carrots, per dozen bunches	4d. to 9d.
Chocos, per quarter-case	1s. 6d. to 2s.
Beetroot, per dozen bunches	8d. to 9d.
Marrows, per dozen	1s. to 2s.
Lettuce, per dozen	2d. to 6d.
Parsnips, per dozen bunches	6d. to 9d.
Sweet Potatoes, per sugar bag	1s. 6d. to 1s. 9d.
Table Pumpkins, per dozen	1s. 6d. to 2s. 6d.
Tomatoes, per quarter-case	4s. to 6s.
Vegetable Marrows, per dozen	...
Turnips, per dozen bunches	...
Rhubarb, per dozen bundles	

SOUTHERN FRUIT MARKETS.

Article.	JANUARY. Prices.
Bananas (Queensland), per case	10s. to 12s.
Bananas (Fiji), per case	17s. 6d. to 19s.
Bananas (G.M.), per case	19s. to 21s.
Custard Apples, per tray	...
Lemons (Local), per bushel-case	6s. to 10s.
Mandarins, per case	...
Mangoes, per bushel-case	6s. to 8s.
Oranges (Navel), per case	...
Oranges (other), per case	...
Pears, per case	...
Papaw Apples, per half-bushel-case	3s. to 7s.
Passion Fruit, per half-case	...
Persimmons, per half-case	...
Pineapples (Queens), per double-case	8s. to 12s.
Pineapples (Ripleys), per double-case	5s. to 7s.
Pineapples (Common), per double-case	5s. to 7s.
Strawberries (Local), per dozen punnets*	5s. to 12s.
Tomatoes (Queensland), per half-bushel-case	2s. to 5s.

* 1 punnet = 1 quart.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	JANUARY. Prices.
Apples, Eating, per case	8s. to 12s.
Apples, Cooking, per case	5s. to 8s.
Apricots, per quarter-case	1s. 6d. to 4s. 6d.
Bananas (Cavendish), per dozen	1½d. to 4d.
Bananas (Sugar), per dozen	1½d. to 2¾d.
Cape Gooseberries, per case	...
Cocoanuts, per sack	12s. to 15s.
Cumquats, per quarter-case	3s. 6d. to 4s. 9d.
Custard Apples, per quarter-case	...
Granadillas, per quarter-case	...
Lemons, per case	6s. to 12s.
Limes, per quarter-case	..
Mandarins, per case	12s. to 13s.
Mangoes, per case	5s. to 8s.
Nectarines, per cwt.	1s. to 3s.
Oranges, (Navel), per case	9s. to 10s.
Oranges (other), per case	4s. to 8s.
Papaw Apples, per case	9d. to 1s.
Passion Fruit, per quarter-case	1s. to 1s. 9d.
Peaches, per quarter-case	1s. to 3s. 6d.
Pears, (local), per quarter-case	2s. 6d. to 4s.
Peanuts, per pound	3d. to 4d.
Persimmons, per quarter-case	...
Plums, per quarter-case	2s., 3s. 6d.
Pineapples (Ripleys), per dozen	1s. to 3s.
Pineapples (Rough), per dozen	9d. to 1s. 6d.
Pineapples (Smooth), per dozen	1s. 6d. to 3s.
Quinces, per case	...
Rockmelons, per dozen	...
Strawberries, per dozen boxes	...
Tomatoes, per quarter-case	4s. to 6s.
Watermelons, per dozen	2s. 6d. to 7s.

TOP PRICES, ENOGGERA YARDS, DECEMBER, 1916.

Animal.	DECEMBER. Prices.
Bullocks	£18 15s. to £20 7s. 6d.
Cows	£12 17s. 6d. to £15 2s. 6d.
Merino Wethers	32s. 3d.
Crossbred Wethers	38s. 9d.
Merino Ewes	26s. 9d.
Crossbred Ewes	30s.
Lambs	30s.
Pigs (Porkers)	66s.

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET AT BRISBANE AND THE PHASES OF THE MOON

On account of the alteration of Civil (Clock) Time which took place on 1st January, it is necessary to *add one hour* to all the times given on this page till the last Sunday in March.

1917.	JANUARY.		FEBRUARY.		MARCH.		APRIL.	
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	4·57	6·46	5·21	6·41	5·41	6·19	5·58	5·46
2	4·58	6·46	5·22	6·41	5·41	6·18	5·59	5·45
3	4·59	6·46	5·23	6·40	5·42	6·17	5·59	5·44
4	4·59	6·46	5·24	6·40	5·43	6·16	6·0	5·43
5	5·0	6·46	5·25	6·39	5·44	6·15	6·0	5·42
6	5·1	6·47	5·25	6·39	5·45	6·14	6·1	5·41
7	5·2	6·47	5·26	6·38	5·45	6·13	6·1	5·39
8	5·3	6·47	5·27	6·37	5·46	6·12	6·2	5·38
9	5·3	6·47	5·28	6·36	5·46	6·11	6·2	5·37
10	5·4	6·48	5·29	6·35	5·47	6·10	6·3	5·36
11	5·5	6·48	5·29	6·35	5·47	6·9	6·3	5·35
12	5·6	6·47	5·30	6·34	5·48	6·8	6·4	5·34
13	5·6	6·47	5·31	6·33	5·48	6·7	6·4	5·33
14	5·7	6·47	5·32	6·32	5·49	6·6	6·5	5·32
15	5·8	6·47	5·32	6·32	5·49	6·5	6·5	5·31
16	5·9	6·47	5·33	6·31	5·50	6·3	6·6	5·30
17	5·9	6·47	5·34	6·30	5·50	6·2	6·6	5·29
18	5·10	6·47	5·35	6·29	5·51	6·1	6·7	5·28
19	5·11	6·47	5·35	6·28	5·51	6·0	6·7	5·27
20	5·12	6·46	5·36	6·28	5·52	5·59	6·8	5·26
21	5·13	6·46	5·37	6·27	5·52	5·58	6·8	5·25
22	5·13	6·46	5·37	6·26	5·53	5·57	6·8	5·24
23	5·14	6·45	5·38	6·25	5·53	5·56	6·9	5·23
24	5·15	6·45	5·38	6·24	5·54	5·55	6·9	5·23
25	5·16	6·45	5·39	6·23	5·54	5·54	6·10	5·22
26	5·16	6·44	5·39	6·22	5·55	5·52	6·10	5·21
27	5·17	6·44	5·40	6·21	5·55	5·51	6·11	5·20
28	5·18	6·43	5·40	6·20	5·56	5·50	6·11	5·19
29	5·19	6·43	...	...	5·57	5·49	6·12	5·18
30	5·19	6·42	...	...	5·57	5·48	6·12	5·18
31	5·20	6·42	...	..	5·58	5·47	...	...

The Phases of the Moon commence at the times stated in Queensland, New South Wales, and Victoria only.

			H. M.
8 Jan.,	○	Full Moon	5 42 p.m.
16 ,,	☽	Last Quarter	9 42 ,,
23 ,,	●	New Moon	5 40 ,,
30 ,,	☾	First Quarter	11 1 a.m.

There will be a total eclipse of the moon on 8th Jan. before it rises in Queensland, but the moon will still be partly in the shadow of the earth for about three-quarters of an hour after it becomes visible. It will be farthest from the earth on the 9th January, and nearest on the 23rd.

7 Feb.,	○	Full Moon	1 28 p.m.
15 ,,	☽	Last Quarter	11 53 a.m.
22 ,,	●	New Moon	4 9 ,,

It will be farthest from the earth on the 6th Feb., and nearest on the 21st.

1 Mar.	☾	First Quarter	2 43 a.m.
9 ,,	○	Full Moon	7 58 ,,
16 ,,	☽	Last Quarter	10 33 p.m.
23 ,,	●	New Moon	2 5 ,,
30 ,,	☾	First Quarter	8 36 ,,

It will be farthest from the earth on the 5th about midnight, and nearest on the 21st about 7 p.m.

7 Apr.	○	Full Moon	11 49 p.m.
15 ,,	☽	Last Quarter	6 12 a.m.
22 ,,	●	New Moon	12 1 ,,
29 ,,	☾	First Quarter	3 22 p.m.

It will be farthest from the earth on the 2nd and on the 30th, and nearest on the 18th.

For places west of Brisbane, but nearly on the same parallel of latitude—27½ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun would rise and set about 4 minutes later than at Brisbane if its elevation (1,900 feet) did not counteract the difference in longitude. In this case the times of sunrise and sunset are nearly the same as those for Brisbane.

At St. George, Cunnamulla, Thargomindah, and Oontoo the times of sunrise and sunset will be about 18 m., 30 m., 38 m., and 49 minutes, respectively, later than at Brisbane.

At Roma the times of sunrise and sunset may be roughly arrived at by adding 17 minutes to those given above for Brisbane.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

The approximate times of sunrise and sunset at Rockhampton can be obtained by adding one hour till 26th March, and the following numbers of minutes to the times given for Brisbane:—

On 1st February for sunrise add 16 m., reducing gradually to 13 m. on 28th.

On 1st February for sunset add 4 m., increasing gradually to 6 m. on 28th.

On 1st March for sunrise add 13 m., reducing gradually to 9 m. on 31st.

On 1st March for sunset add 7 m., increasing gradually to 10 m. on 31st.

On 1st April for sunrise add 9 m., reducing gradually to 5 m. on 30th.

On 1st April for sunset add 9 m., increasing gradually to 14 m. on 30th.

[All the particulars on this page were computed for this Journal, and should not be reproduced without acknowledgment.]

Statistics.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF DECEMBER IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING DECEMBER, 1916 AND 1915, FOR COMPARISON.

Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	Dec	No. of Years' Records.	Dec., 1916.	Dec., 1915.		Dec.	No. of Years' Records.	Dec., 1916.	Dec., 1915.
North Coast.					*South Coast*—continued:				
	In.		In.	In.		In.		In.	In.
Atherton	7·10	15	17·74	9·15					
Cairns	8·99	34	25·13	16·64	Nambour	6·03	20	13·80	2·35
Cardwell	8·14	44	24·15	8·64	Nanango	3·64	34	3·39	4·05
Cooktown	6·67	40	16·63	8·71	Rockhampton ...	4·33	29	9·44	2·03
Herberton	5·35	29	13·81	8·56	Woodford	5·25	29	11·02	1·33
Ingham	6·28	24	24·98	9·07					
Innisfail	11·91	35	29·99	18·81					
Mossman	16·41	1	26·43	13·89	*Darling Downs.*				
Townsville	5·44	45	17·99	3·22					
					Dalby	3·14	46	1·64	2·18
					Emu Vale	3·49	20	2·51	4·22
Central Coast.					Jimbour	3·22	28	1·04	2·26
					Miles	2·57	31	2·07	1·46
Ayr	3·56	29	8·31	1·88	Stanthorpe ...	3·45	43	2·59	3·13
Bowen	4·13	45	11·04	1·23	Toowoomba ...	4·19	44	3·72	4·55
Charters Towers ...	3·50	34	10·69	5·06	Warwick	3·46	29	2·26	3·92
Mackay	6·76	45	17·56	7·40					
Proserpine	7·79	13	24·54	7·89					
St. Lawrence ...	4·28	45	8·45	4·18	*Maranoa.*				
					Roma	2·32	42	3·38	1·30
South Coast.									
					State Farms, &c.				
Biggenden	4·74	17	*	2·39					
Bundaberg	4·45	33	6·63	3·12					
Brisbane	5·02	65	5·10	1·33	Bungeworgorai ...	2·76	4	5·69	0·91
Childers	5·23	21	6·29	3·72	Gatton College ...	3·32	17	2·63	1·37
Crohamhurst ...	7·26	25	12·33	2·52	Gindie	2·58	17	9·82	1·15
Esk	4·35	29	2·93	1·85	Hermitage ...	2·64	10	2·82	3·57
Gayndah	3·86	45	3·38	2·77	Kairi	9·60	4	18·89	8·06
Gympie	5·89	46	5·31	7·37	Kamerunga ...	6·90	27	23·58	7·85
Glasshouse M'tains	6·64	8	14·24	1·39	Sugar Experiment				
Kilkivan	4·28	37	3·98	3·58	Station, Mackay	7·99	19	24·44	8·47
Maryborough ...	4·49	45	5·59	2·37	Warren	4·61	4	7·93	1·72

* Incomplete

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for December this year and for the same period of 1915, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND,
Divisional Officer.

Farm and Garden Notes for March.

FIELD.—Take every opportunity of turning up the ground in readiness for sowing and planting winter crops. The main crop of potatoes should at once be planted. As the growth of weeds will now be slackening off, lucerne may be sown on deeply cultivated soil. The latter should be rich and friable, with a porous subsoil. The land should be thoroughly pulverised. Do not waste time and money in trying to grow lucerne on land with a stiff clay subsoil. Prepare the land a couple of months before sowing, care being taken to cross plough and harrow before the weeds have gone to seed. This ensures a clean field. Sow either broadcast or in drills. In the former case, 20 lb. of seed will be required; in the latter, 10 lb. A good stand of lucerne has been obtained with less quantities. Should weeds make their appearance before the plants have sent down their tap roots, mow the field. Before they can again make headway enough to do any damage, the lucerne will be strong enough to hold its own against them. Harrow and roll the land after mowing. Gather all ripe corn. It is now too late to sow maize, even 90-Day, with any certainty of harvesting a crop of grain. Rye grass, prairie grass, oats, barley (in some districts, wheat), sorghum, vetches, carrots, mangolds, and Swede turnips may be sown. In Northern Queensland, sow tobacco seed, cowpea, carob beans, sweet potatoes, opium poppy, &c. Sow anatto, jack fruit, and plant kola-nut cuttings. Some temperate-zone vegetables may be planted, such as egg plants, potatoes, &c. Coffee-planting may be continued. Harvest kafir corn and paddy.

FLOWER GARDEN.—Now is the time to plant out bulbs. A complete garden could be furnished with these charming plants, which are to be had in every colour and variety. Amongst the many are—Amaryllis, anemone, arum, babiana, crinum, crocus, freesia, ranunculus, jonquils, iris, ixias, gladiolus, narcissus, Jacobean lilies, tigridia, tritonia.

All bulbs like well-drained, somewhat sandy soil, with a plentiful admixture of leaf mould. Herbaceous plants and annuals which it is intended to raise from seed should be sown this month. Such are antirrhinums (snapdragon), asters, cornflowers, dianthus, larkspurs, daises, cosmea, candytuft, lupins, gaillardias, godetia, mignonette, poppies, pansies, phlox, sweet peas. Cannas now planted will require plenty of food in the shape of liquid manure. Put in cuttings of carnations. Chrysanthemums require attention in the way of disbudding, staking, watering with liquid manure, &c. Growers for exhibition will thin out to a few buds and protect the flowers from rain and sun. Dahlias should be looking well. To secure fine blooms, disbudding should be done.

Now, as to climbers which may now be planted. These are—*Allamanda Schotii* (beautiful yellow), *Antigonon leptopus*, a charming

cerise-coloured climber; *Aristolochia elegans,* handsome as an orchid and easily grown; *Aristolochia ornithocephala* (Dutchman's Pipe), very curious, large, always attracts attention; *Asparagus plumosa* grows in any shady place; *Beaumontia grandiflora,* splendid white flower, grand for a fence, will grow 50 ft. high; Bignonias of several kinds; Bougainvilleas, with their splendid leafy pink and purple flowers, rapidly clothe a fence or unsightly shed with a blaze of blossom; *Quisqualis indica,* a fine creeper, flower pink, changing to white; Wistaria, purple and white. Most beautiful is the *Bauhinia scandens,* rarely seen about Brisbane. We grew a plant of this climber at Nundah, and it soon closed in the front of the veranda for a distance of over 80 ft. The leaves are very small, and in the flowering season it presents almost a solid mass of beautiful round bunches of blossoms, something like the hawthorn bloom —pink and white. It seeds freely, but the seeds are difficult to germinate, and when they have produced a plant it is still more difficult to rear it. A rooted sucker from the main stem will in all probability grow.

KITCHEN GARDEN.—During this month a very large variety of vegetable seeds may be sown in readiness for planting out where necessary in the autumn, which begins on the 20th of March. All unoccupied land should be roughly dug, and, where required, add well-decomposed manure. Transplant cabbage, cauliflower, celery, &c. Sow French beans, beet, carrot, turnips, radish, cabbage, cauliflower, cress, peas, mustard, &c. Former sowings should be thinned out and kept clear of weeds. Mulch round melon and cucumber beds with a good dressing of long stable manure, as it assists in keeping the fruit clean and free from damp. Cucumbers, melons, French beans, and tomatoes should be looked for every day and gathered, whether required or not, for, if left on the vines to perfect their seeds, the plants will soon cease to be productive, or will form inferior, ill-shaped, and hence unsaleable fruit.

Orchard Notes for March.

THE SOUTHERN COAST DISTRICTS.

The marketing of the main crop of pineapples will continue to occupy the attention of growers; and as it is probable that the plantations have been allowed to get somewhat dirty during the previous month, they should be cleaned up as soon as ever the crop has been got off. The fruit of the new crop of citrus fruit will be showing signs of ripening towards the end of the month; and as the fruit during this period of its growth is very liable to the attack of insect pests of various kinds, it is important that steps should be taken to prevent loss arising from this cause as far as possible.

Large sucking moths of several kinds attack the fruit as soon as it shows signs of ripening; and as they always select the first fruit that shows signs of colouring, it is a good plan to gather a few forward fruit and to ripen them up quickly by placing them on the barn floor, and covering them up with bags or straw. They will turn colour in a few days, and develop the characteristic scent of the ripening fruit. The fruit so treated should be hung up in conspicuous places in the orchard as trap-fruit, as not only will it attract the moths, but also the fruit-flies. The moths will be found clustered round the trap-fruits in large numbers, and can then be easily caught and destroyed. Fruit-fly will also puncture such fruit; and if the fruit is destroyed before the larvæ reach maturity, a later crop of these insects is prevented from hatching out. Fruit-flies may also be caught in large numbers by means of such artificially ripening fruits. The fruits are smeared with tanglefoot, and hung about the orchard. The fly, attracted by the colour, settles on the fruit, and is caught in a similar manner to house-flies on specially prepared sticky paper. These simple remedies, if carefully carried out, will result in the destruction of large numbers of sucking moths and fruit-flies.

The yellow peach-moth that does such damage to peaches in spring, and that attacks corn, sorghum, cotton bolls, custard apples, and many other plants and fruits, often does a lot of damage to citrus fruits. It acts in a very similar manner to the second and later generations of the Codling moth of pomaceous fruits, in that it lays its eggs where two fruits touch, under the shelter of a leaf on the fruit, (at the stem end of the fruit, and, in the case of navel oranges, in the navel itself; in fact, anywhere that there is a likelihood of the egg not being disturbed. The egg hatches out into a small spotted caterpillar, which eats its way into the fruit, causing it to ripen prematurely, and fall off. Where two fruits touch, it often eats into and destroys both, and it frequently leaves one fruit to go and destroy a second. It is a very difficult insect to deal with, owing to the number of fruits and plants on which it lives; but, as far as citrus fruits are concerned, the best remedy is undoubtedly to spray the fruit with a remedy that will destroy the young insect when it starts to eat the skin of the fruit. Bordeaux mixture has been found efficacious, but I am of opinion that spraying with Paris green and lime, Kedzie's mixture, or arsenite of lead, will also have good results. The latter poison is, in my opinion, well worth giving a thorough test, as it sticks to the fruit and leaves for a long time. Bordeaux mixture, either alone or in conjunction with Paris green or Kedzie's mixture, is, however, a good remedy, as not only will it destroy the larvæ or prevent the moth from attacking the tree, but it is also the best remedy for black brand or melanose, as well as tending to keep all other fungus pests in check. Fight fruit-fly systematically—both by means of the sticky fruit already recommended and by gathering all fly-infested fruit, such as guavas, late mangoes, kumquats, &c., as well as any oranges or mandarins that may have been infested, as if kept in check now there will be little loss throughout the season. A little fruit will be marketed towards the end of the month. See that it is gathered and sweated for seven days before

marketing, and don't gather it too immature. Beauty of Glen Retreat mandarins are often gathered and marketed as soon as they show signs of colouring. They are then as sour as a lemon, and anyone who is unlucky enough to buy them will steer off mandarins for some time to come. This variety should not be gathered till thoroughly ripe, as when marketed in an immature state it spoils the market, as it puts people off eating citrus fruit.

Clean up the orchard after the summer rains, and have everything ready for the marketing of the crop. See that there is a good supply of clean, dry case timber on hand, as one of the greatest sources of loss in shipment is packing fruit in green cases.

Strawberry planting can be done throughout the month. Plant such berries as Federation on the lowest ground, and Aurie, Anetta, Trollop's Victoria, and Glenfield Beauty on warm, well-drained soils. Prepare the land thoroughly, so that it is in perfect tilth, and in a fit state to retain moisture well; as on this, as much as anything, the success of the crop depends. Where new orchards are to be planted, get the land ready—not the clearing, which should have been done months ago, but the working of the land, as it is advisable to get it thoroughly sweetened before putting the trees in.

THE TROPICAL COAST DISTRICTS.

The Notes for February apply equally to March. See that bananas are netted—keep down weed growth, and market any sound citrus fruits. Clean up the orchards as well as possible, and keep pines clean. Get land ready where new orchards are to be set out, as tree-planting can be done during April and May. Pines and bananas can still be planted, as they will become well established before winter.

THE SOUTHERN AND CENTRAL TABLELANDS.

Finish the gathering of the later varieties of deciduous fruits, as well as grapes. Clean up the orchard, and get ready for winter. Get new land ready for planting; and where there are old, dead, or useless trees to be removed, dig them out and leave the ground to sweeten, so that when a new tree is planted to replace them the ground will be in good order.

In the drier parts, where citrus trees are grown, keep the land well worked, and water where necessary.